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LEARNING TO COPE WITH FAILURE

by

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A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Learning to Cope with Failure" submitted by Joy L. Cullen in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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ABSTRACT

Thirty learning disabled and thirty normally achieving fourth-grade boys were exposed to failure on a problem-solving task, following which they received either tutor-assistance or self-instructional training to induce successful experiences of coping with failure, or a no-training condition. Effects of training were assessed from performance on a subsequent problem-solving task and from a measure of continuing motivation. For learning disabled boys, tutor-assistance training was more effective than self-instructional training for decreasing the number of problems on which the child gave up prior to solution on the test task. Compared with their untrained controls, learning disabled boys with tutor-assistance training solved more problems and gave up fewer problems prior to solution. Training effects were less clearcut for the normally achieving boys for whom impaired performance was apparent only in the average time taken by untrained boys on the test problems. Continuing motivation increased with learning disabled boys who had received tutor-assistance training and normally achieving boys without training. Normally achieving boys without training attributed failure on the test task to the adoption of specific task strategies while learning disabled boys without training attributed failure to task difficulty.

Results were interpreted within a learned helplessness framework. It was suggested that the learning disabled boys' history of

failure had generalised to novel achievement situations and that characteristics of learned helplessness were apparent in the inefficient task strategies and impaired performance of these children. The manifestation of learned helplessness was less evident for normally achieving children who appeared to have developed active and independent strategies for coping with failure.

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CHAPTER ONE

INTRODUCTION

Context of the Problem

In recent years educators have shown a growing tendency to highlight the educational and sociological processes which contribute to student failure instead of the individual or psychological variables which affect achievement. This trend is illustrated by the considerable literature on the institutional causes of failure (e.g., Covington & Beery, 1976; Glasser, 1975; Holt, 1964) and on the influence of teacher expectations on pupil performance (Brophy & Good, 1974).

Developments within instructional theory have also diverted attention away from the individual's response to failure. Programmed learning techniques, behavior modification procedures, and mastery learning approaches have all focused upon success-oriented learning which frequently precludes the experience of failure. In these approaches the student's success is dependent upon the specific contingencies of the instructional procedures. In the broader learning environment, however, the highly structured procedures favored by such approaches are rarely present and the child's early attempts at problem solving may be only partially successful. Consequently, the coping strategies children develop in these situations are an important aspect of the growth of independence and mastery.

While descriptive accounts are available of children's failure-avoidant tactics (e.g., Covington & Beery, 1976; Jackson, 1968) the empirical investigation of the specific mechanisms which mediate children's constructive responses to failure is limited. The investigation of the independent coping strategies children use following exposure to failure in achievement situations is, therefore, an area requiring further development.

The literature on "learned helplessness" (e.g., Dweck & Goetz, 1978) has shown that initial experiences of inability to cope with failure may generalize so that some children develop a learning set of "helplessness" which is associated with passive and inefficient strategies in problem-solving situations. The recent learned helplessness literature has also indicated that these children can be trained to take a more active role in their learning. An important step towards a clearer understanding of how children learn to be either helpless or mastery-oriented in achievement situations, is to identify instructional procedures which influence children's coping strategies.

Studies of instructional procedures which are concerned with the active and constructive role of the learner generally adopt a cognitive approach to learning. A cognitive model emphasizes the importance of understanding the cognitive and affective processes which influence the learner's behavior (Wittrock, 1979). The conclusion of the learned helplessness research that attributions for success and failure are a critical factor in the development of learned helplessness in humans is consistent with this position. From a cognitive perspective, therefore, the study of the student's cognitions in achievement situations is essential to the analysis of children's reactions to failure.

The primary objective of the present study was to investigate the effectiveness of two training procedures, tutor-assistance, and self-instructional, for reversing learned helplessness in children's problem-solving behaviors and for influencing children's continuing motivation to solve similar problems. A further objective was to investigate the nature of children's causal attributions for failure within the experimental situation.

Definitions of the Major Concepts

Failure. The child's lack of immediate success in a problem-solving situation.

Learned helplessness. The child's perception of the termination of failure in a problem-solving situation as independent of his responses.

Coping strategies. The child's responses which deal with failure in a problem-solving situation.

Continuing motivation. The tendency to return to and continue working on tasks away from the instructional context in which they were initially confronted (Maehr, 1976).

Attributions. The child's beliefs about the causes of success and failure.

Tutor-assistance training. A training procedure which directs the child's coping strategies toward help from an external source, the tutor (experimenter).

<u>Self-instructional training</u>. A training procedure which directs the child's coping strategies toward a self-instructional prompt (a cue card).

Scope and Significance of the Study

The study was restricted to the specific behaviors and cognitions associated with the experimental procedures which were designed to encompass a miniature learning situation. No attempt was made to tap generalized dispositions but the child's history of failure was varied by selecting subjects from two groups of children, a group of normally achieving students and a group of students who were receiving part-time resource room assistance for specific academic difficulties. The selection of the resource room students was based on the assumption that children requiring such assistance would have experienced considerable failure in the school setting.

A central problem for educators is the development of appropriate intervention procedures with children who experience learning difficulties. Consequently, the study's attempt to delineate some of the variables which affect children's coping strategies with students who were experiencing academic difficulties as well as those who were achieving normally is of practical significance for the educator. The study of methods of reversing helplessness also contributes to a clearer conceptualization of the learned helplessness model, which to date, has been equivocal regarding the alleviation of learned helplessness in humans (Miller & Norman, 1979).

CHAPTER TWO

REVIEW OF THE RELATED LITERATURE

The Theoretical Perspective

The phenomenon of impaired performance following experimentally-induced failure was first documented in the early studies of psychological stress (Lazarus, Deese, & Osler, 1952). The focus of this research was on the effects of stress on performance and theoretical interest did not extend to the specific cognitive or affective processes which mediated reactions to failure. In the past decade there has been a reawakening of research interest in such performance deficits. Primarily generated by the theory of learned helplessness (Seligman, 1975; Abramson, Seligman, & Teasdale, 1978), but reflecting also the contributions of the social learning and attribution theories of the sixties (Crandall, Katkovsky, & Crandall, 1965; Rotter, 1966; Weiner, 1972), the recent studies have directed research toward the cognitive and affective mediators of reactions to success and failure.

The term "learned helplessness" was first used by Seligman and his associates (Maier, Seligman, & Solomon, 1969; Seligman & Maier, 1967) to explain the behavior of an organism which, following exposure to uncontrollable events, learns that responding is futile. A distinguishing feature of the helplessness theory is that it is stated in cognitive terms: the organism develops a cognitive representation, or expectancy, that responding and an outcome are independent. A subsequent restatement of the theory (Abramson et al., 1978), which takes into account the constructs of attribution theory, refines the concept of a cognitive representation. According to the reformulation, perceptions of response-outcome independence are affected by attributions which may be stable or unstable, global or specific, and internal or external, and which determine subsequent expectations that outcomes will occur independently of voluntary responses.

The attributional analysis enabled Abramson et al. (1978) to distinguish the notions of universal and personal helplessness, where the former refers to events which are perceived to be uncontrollable for all people and the latter to events which are perceived to be uncontrollable for an individual. School failure, restricted here to individual instances of failure in problem-solving situations, exemplifies the latter category of personal helplessness. Failure, in this sense, involves the individual's belief that he is unable to cope with the problematic situation.

The consideration of children's academic failure within the framework of personal helplessness distinguishes it from studies of universal helplessness for which external causal attributions are feasible. The sociological research on powerlessness and poverty (Vance, 1973) and the early studies of human helplessness which induced perceptions of uncontrollability by administering noncontingent aversive noise or electric shock (e.g., Fosco & Geer, 1971), describe situations in which the individual can attribute uncontrollability to environmental factors. According to the restated theory, personal helplessness involves an internal attribution for failure. Consequently, remediation is more concerned with the development of personal coping skills and perceptions of personal efficacy than with the alteration of environmental contingencies.

Learned Helplessness in Children

One of the first studies with children to adopt a learned helplessness framework (Dweck & Reppucci, 1973), identified fifth grade children as persistent or helpless following experimentally-induced noncontingent failure on a block design task. The children's generalized attributions for success and failure to either effort or ability were assessed from the Intellectual Achievement Responsibility scale which measures children's acceptance of responsibility for academic successes and failures (Crandall et al., 1965). The study found that persistent subjects showed greater internal responsibility for achievement outcomes than did helpless children. These children also tended to attribute their success or failure to effort rather than to ability.

Helpless children have also been identified on the basis of school achievement. Butkowsky and Willows (1979) found that Grade 5 boys who had been identified as poor readers displayed characteristics associated with learned helplessness following experimentally-induced failure on nonverbal tasks. The findings indicate that attributions mediated the generalization of initial failure with reading in a classroom setting to a novel, nonverbal task in an experimental situation, Poor readers attributed failure to lack of ability, a stable internal dimension, and success to factors beyond personal control. Both beliefs would lead to a low expectancy of success across a broad range of situations and discourage further attempts to persist with a difficult task. On the other hand, average and good readers attributed failure to more variable factors and did not substantially lower expectancies for future success following failure.

A further study (Diener & Dweck, 1978) identified groups of helpless and mastery-oriented children on the basis of effort attributions and found that whereas helpless children made the expected attribution to lack of ability following a failure experience, mastery-oriented children engaged in self-monitoring and self-instructions concerned with remedies for failure. For the helpless children, attributing failure to lack of ability seemed to interfere with the development of strategies for coping in problem-solving situations and for minimizing the negative effects of initial failure on a task.

According to learned helplessness theory, perceptions of response-outcome independence are fostered by socialization conditions which fail to provide children with successful experiences of control over their environment. This hypothesis is supported by studies of the problem-solving performance of children from low socioeconomic levels, where crowded living conditions (Rodin, 1976) and inconsistent reinforcement histories (Bresnahan & Blum, 1971) may reduce opportunities for control of the environment. In similar vein, studies of the development of competence in young children (Baumrind, 1973; White, 1975) stress the importance of the mother's contingent response to the child's verbal and behavioral signals.

Specificity of helplessness effects has been associated with specific socialization agents rather than general socialization histories. Girls and boys differ in their reactions to failure according to whether the agent of evaluation is adult or peer, male or female (Dweck & Bush, 1976). Teachers' differential use of negative feedback with boys and girls also affects the nature of causal attributions in achievement situations (Dweck, Davidson, Nelson, & Enna, 1978). Findings of this nature suggest that sex differences in susceptibility to learned helplessness can be accounted for by differing attributional histories (Dweck & Goetz, 1978).

To summarize, research with children indicates that a learning set of helplessness can be experimentally induced and that children's reactions to failure are determined by their causal attributions for the failure. Additionally, there is some evidence that these effects are paralleled in natural socialization contexts.

Retraining Attributions

Extensive studies on the relation of attribution processes to achievement-related activities (Bar-Tal, 1978; Maehr & Nicholls, in press; Weiner, 1972, 1976, 1979) support the conclusion of the learned helplessness studies that it is the perception of failure, rather than the failure per se, which determines the child's reactions to academic failure. Recognition of the crucial significance of causal attributions for children's achievement has led to the development of attribution retraining procedures with elementary school children.

Dweck (1975) approached this task by teaching children to attribute failure to insufficient effort. Twelve children aged 8 to 13 who had been identified by the school psychologist, school principal, and classroom teacher, as extremely helpless were assigned to either an attribution retraining treatment or a success-only treatment for

25 daily sessions. The two treatments involved training on identical arithmetic problems, but for the attribution treatment, failure trials, for which the experimenter verbally attributed failure to insufficient effort, were also included. Following the training sessions, children who had experienced attribution retraining improved or maintained their performance on the criterion task and showed an increase in the degree to which effort attributions for failure were emphasized. In contrast, the performance of the success-only group continued to deteriorate.

Dweck's (1975) study illustrates the feasibility of attribution retraining procedures for reversing helplessness in children. Qualifying Dweck's findings, however, is the restriction of the performance and attribution changes to the specific experimental tasks. Generalized changes in responsibility for successes and failures, anxiety, and failure avoidance were not obtained. On the other hand, Andrews and Debus (1978) claim to have demonstrated generality and durability of retraining effects. These researchers used direct, situational procedures to identify children who least frequently attributed their failure to lack of effort. The sixth-grade children were then randomly assigned to training conditions of either social reinforcement or social reinforcement plus tokens, for effort attributions on a block design task. Both conditions increased successful performance on parallel forms of the training task as well as two independent tasks, one week and four months following the training session. Increases in effort attributions and degree of persistence on a perceptual task were also obtained.

In an isolated early study, Keister (1943) similarly demonstrated, with nursery school children who had shown immature reaction to failure, that the use of training procedures which emphasize the child's own efforts in overcoming difficulties of task solution could produce lasting and generalized changes. It should be noted that the generality effects obtained in the Keister, and Andrews and Debus studies were based on specific performance-based tasks and cognitions and not the global personality measures which had failed to yield generalized changes in the Dweck (1975) investigation. This pattern of results is consistent with Maehr's (1978) recent analysis of achievement motivation which proposes that attention to the learner's conscious thoughts and perceptions about self and the achievement task will be of more help to education than a focus on personality change.

Successful attempts to alter causal attributions by changing teaching strategies and classroom conditions have also been reported. Heckhausen (1975) and his colleagues selected underachieving fourth-grade children with a pronounced fear of failure and, with the cooperation of classroom teachers, integrated effort-attributional comments for performance with daily classroom procedures. Following the four-and-a-half month treatment period, failure was more frequently ascribed to insufficient effort than to lack of ability and levels of aspiration were less frequently lowered in the face of failure. Training teachers to implement personal causation training in their classrooms over a two-year period has also been effective for increasing the academic performance and perceptions of personal responsibility of sixth- and seventh-grade black students (De Charms, 1972, 1976).

In summary, successful attempts to alter causal attributions have used procedures which focus on the role of effort in overcoming difficulties of task solution. Retraining effects have been demonstrated with specific performance and attributional measures and with longitudinal programs for integrating attributional training with normal classroom procedures.

A Coping Model of Change

The emphasis of the attribution retraining studies on altering attributions to produce changes in performance is in marked contrast to the methods of applied behavioral analysis which have demonstrated the power of performance-based procedures for effecting psychological changes. Current developments within learning theory, which recognize the influence of people's self-directing capacities on behavior (Bandura, 1977a; Meichenbaum, 1977; Mischel, 1973), are today substantially reducing the divergence between the two approaches. Both perspectives emphasize the mediating role of cognitive processes in behavioral change, but additionally, the learning theorists focus on a micro-analysis of behavior for explaining and inducing change. This concern with component behavioral capabilities has resulted in a greater emphasis on the coping skills which produce effective performance and expectations of personal efficacy (Bandura, 1977b).

Distinguishing between methods which are based on mastery and methods which are based on coping is a further refinement of the more recent performance-based procedures (Meichenbaum, 1977). Mastery procedures focus on experience of success; coping procedures encourage the development of the individual's resources for dealing with the threatening situation. In clinical settings, coping procedures have proved to be more effective than mastery procedures (e.g., Meichenbaum, 1971) for effecting change. If the distinction between mastery and coping is taken into account, attribution retraining studies provide additional support for the effectiveness of coping procedures as a vehicle of change. For example, Dweck's (1975) success-only or mastery, treatment failed to reverse learned helplessness whereas the attribution retraining treatment, which included experience of coping with failure, effectively reduced performance deficits.

The importance of learning to cope with failure is also illustrated in a study which used partial reinforcement and attribution retraining procedures to develop reading persistence with children who were experiencing reading difficulties (Chapin & Dyck, 1976). Partial reinforcement involved variable degrees of exposure to success and failure trials. Persistence in reading was jointly facilitated by partial reinforcement and attribution retraining but a success-only condition failed to increase persistence. The authors suggest that the occasional failure involved in the partial reinforcement procedures combined with the attribution retraining taught the individual how to cope with the disruptive effects of failure.

Attribution retraining procedures are designed to enable children to interpret the causes of their failures (Dweck & Goetz, 1978). In similar vein, verbal self-instructional procedures, which modify what children say to themselves about their performance on cognitive tasks (Meichenbaum, 1975), may affect behavior by altering children's self-perceptions and self-verbalizations. Coping procedures in clinical settings also involve self-instructions or verbalizations which sustain effort in dealing with stressful situations (Bandura, 1977b; Meichenbaum, 1971). Thus, the studies of verbal self-instructional procedures further emphasize the significance of cognitive processes for influencing behavior.

Despite their divergent theoretical foundations, the clinical studies of coping and the attribution retraining studies illustrate the parallel development of procedures which incorporate both cognitive and performance-based modes of change. The combined findings of both fields of research support the position that strategies for overcoming personal helplessness should involve the development of personal skills for coping with failure as well as the self-perceptions and verbalizations which mediate the individual's behavioral responses.

To summarize, evidence suggests that training procedures based on a coping model which incorporates performance-based and cognitive strategies will be more effective than mastery approaches for reversing learned helplessness.

Instructional Influences on Continuing Motivation

The phenomenon of continued interest in a task outside the constraints of a classroom probably underlies the philosophical assumption that education is a continuous, and not a school-specific, activity. Yet consideration of "continuing motivation" as an educational outcome has received only limited research attention. The few systematic studies of the construct are currently drawing attention to the possibility that instructional conditions which facilitate immediate classroom performance may have differing, and less positive effects on continuing motivation (Maehr, 1976).

Several studies have confirmed that teacher's evaluation procedures are a critical influence on continuing motivation. American school children (Kremer, 1976; Maehr & Stallings, 1972) and Iranian school children (Salili, Maehr, Sorensen, & Fyans, 1976) have shown continuing interest in a task after working on them under conditions of self-evaluation. In contrast, external evaluation conditi... reduced subsequent motivation in the task, although negative effects on immediate task performance were not observed. A study of the effects of two reinforcement conditions, knowledge of results and tangible reinforcers, also found that the addition of an extrinsic reward to an intrinsically interesting task reduced the subsequent interest of third-grade subjects in the task (Sorenson & Maehr, 1976). Similar findings have been reported in studies of intrinsic motivation (Deci, 1975; Lepper & Greene, 1978) where conditions of surveillance and extrinsic rewards reduced subsequent spontaneous interest in the experimental task.

Individual differences may also affect continuing motivation. For example, achievement motivation has been identified as a crucial antecedent (Maehr & Stallings, 1972). In this regard, it is likely that learned helplessness will be an important influence on subsequent interest in a task. Maehr (1976) argues that individuals, such as the helpless student, who have developed a bias toward interpreting their performance in negative ways, are unlikely to develop and exhibit continuing motivation. A researchable question, therefore, is the extent to which exposure to failure, as in the typical helplessness experiment, will affect indices of continuing motivation.

The second issue relating to the theory of learned helplessness concerns the nature of training procedures for reversing helplessness deficits. From the viewpoint of the continuing motivation research, it is probable that training conditions which differentially emphasize the roles of external aid and personal resources for reducing helplessness will also differentially affect continuing motivation for the task. In theoretical terms, this assumption arises from the premise (Maehr, 1976) that the individual who sees himself as the initiator or cause of his own behavior will exhibit continuing motivation.

To conclude, the study of continuing motivation as it interrelates with an individual variable, learned helplessness, and a situation variable, training conditions for reversing helplessness deficits, should contribute to the theoretical explication of both continuing motivation and learned helplessness. Furthermore, a study of the interrelationship of the two variables should expand our understanding of their relevance to educational practice.

Summary

The literature relating to learned helplessness indicates that children can develop a learning set of helplessness in academic situations. Additional findings are that helplessness deficits can be reduced by changing children's attributions for success and failure. Training studies also suggest that successful experiences of coping with failure can reduce helplessness deficits. Important methodological considerations relate to the use of performance-based procedures and specific attribution measures, and to the differential effects of training procedures on short- and long-term measures of performance.

In this respect, continuing motivation, a behavioral indication of continued interest in a task, is a promising construct for assessing long-term training effects.

CHAPTER THREE

RATIONALE FOR THE STUDY

The Research Hypotheses

The primary objective of the study was to test the hypothesis that successful experiences of coping with failure would reverse learned helplessness in elementary school children. Attribution re-training studies (Chapin & Dyck, 1976; Dweck, 1975) and clinical techniques (Bandura, 1977b; Meichenbaum, 1977) provide empirical support for the premise which underlies this hypothesis, that learning to cope with failure is an important dimension of effective problem-solving behaviors. To refine further the notion of coping in an academic context, the study investigated the effectiveness of two training procedures, tutor-assistance and self-instructional, wh[illegible] regarded as potential strategies for coping with failure. The training procedures were also designed to parallel typical instructional procedures in elementary schools.

In accordance with the cognitive framework of the learned helplessness and cognitively-oriented learning theories, the two training conditions combined a modified effort-attributional procedure with performance-based strategies to train children to perform successfully on an initially failed task. The attributional procedures attributed successful task solution to the child's task strategy in preference to the more generic attribution to effort. Similarly, following initial failure on the task, the attributional procedures emphasized the child's failure to adopt the specific training strategy rather than his failure to try. This refinement of the attributional procedure arose from the greater emphasis the present study placed on the significance of coping strategies for reversing helplessness.

By adopting the modified effort-attributional procedures the study attempted to overcome a potential problem of the earlier attribution retraining studies, the misconception that it is effort alone which produces effective performance. As the work of Nicholls (1976, 1978) has pointed out children eventually learn that effort is an insufficient prerequisite for academic success. With this constraint in mind, the present study attempted to develop a procedure which integrated renewed effort with the adoption of a specific task strategy. The study thus appears to have potential for overcoming the problems associated with the earlier retraining studies' neglect of the behavioral (or skill) components of effective performance.

A second objective of the study, derived from the research on continuing motivation (Maehr, 1976), concerns the expectation that training conditions which differentially emphasize the role of external aid and personal resources for coping with failure will differentially influence continuing motivation. To this end, it was hypothesized that self-instructional training would have a more positive influence on continuing motivation than would tutor-assistance training. The generalization of short-term training effects to classroom achievement was not expected, or assessed. Consequently, the assessment of continuing motivation in the present study also provided some indication of the generality of the training effects from a behavior which was relevant to children's long-term achievement and conceptually and temporally distinguishable from the experimental situation.

The Significance of a History of Failure

To vary the history of failure brought to the experimental situation, learning disabled children who were receiving part-time resource room placement for specific learning problems, were compared with normally achieving students. The term "learning disabled" is currently used to describe children with comparable levels of intelligence to normally achieving children but who are experiencing difficulties with specific subjects (Lerner, 1976). The learning disabled student receives most of his or her instruction in regular classrooms but is, in addition, assigned to remedial tuition in resource room programs. Because of the greater incidence of boys in resource room programs in the elementary grades, and the widespread findings of sex differences in causal attributions for success and failure (Dweck & Bush, 1975; Dweck & Reppucci, 1973; Nicholls, 1975), learning disabled boys were selected for the study. The predominance of language and reading problems with learning disabled students (Lerner, 1976) guided the adoption of the nonverbal experimental tasks.

Learning disabled children are characterized by an absence of active and efficient task strategies (Torgesen, 1977) and greater external perceptions of success compared with normally achieving students (Chapman & Boersma, 1979). Such characteristics suggested that the inclusion of learning disabled students in the study could substantially qualify the overall research hypotheses.

If learning disabled children are less active and more externally oriented in achievement situations it follows that training procedures which emphasize the use of external resources for coping with failure should be more effective for reversing helplessness than procedures which place a greater emphasis on the child's personal resources. Furthermore, children with a history of failure are likely to reject unexpected success (Mettee, 1971). By allowing the learning disabled child to give some credit for success to the help of an adult, tutor-assistance training should also reduce the threatening aspects of continued involvement with the task. Conversely, normally achieving children, who are more internally oriented in successful achievement situations (Chapman & Boersma, 1979), would be expected to perform more effectively and show continuing interest in a task under training conditions which emphasized the child's personal resources for coping with failure. On the basis of these expectations, the study has attempted to associate differential instructional, or training, effects with an individual variable, the student's history of failure.

Pilot data had confirmed that normally achieving and learning disabled students exhibited differing patterns of performance following the induction of success and failure on the experimental tasks. Consequently, the following hypotheses were stated separately for the normally achieving and learning disabled groups.

Hypothesis 1a. Self-instructional training will be more effective than tutor-assistance training for reversing learned helplessness with normally achieving children.

Hypothesis 1b. Tutor-assistance training will be more effective than self-instructional training for reversing learned helplessness, with learning disabled children.

Hypothesis 2a. Self-instructional training will have a more positive influence on continuing motivation than tutor-assistance training, with normally achieving children.

Hypothesis 2b. Tutor-assistance training will have a more positive influence on continuing motivation than self-instructional training, with learning disabled children.

The Assessment of Learned Helplessness

From the perspective of learned helplessness theory (Abramson et al., 1978), children who do not experience success in coping with failure would be expected to show signs of learned helplessness on a subsequent task. Continuing motivation theory (Maehr, 1976) suggests further that helpless children would not develop continuing motivation. Thus, in terms of the expected helplessness deficits in the absence of training, the research hypotheses can be stated as follows.

Hypothesis 1c. Children who do not receive training will exhibit learned helplessness.

Hypothesis 2c. Children who do not receive training will not exhibit continuing motivation.

The Role of Attributions

A secondary objective of the study was to investigate the nature of causal attributions for failure both before and after training. The reformulated theory of learned helplessness (Abramson et al., 1978) proposes that success modifies attributions along a global-specific dimension. Pilot verbal responses to the attribution question "Why do you think you had trouble solving the puzzle?" following experimentally-induced failure had indicated that causal attributions tended to focus on specific strategies and task characteristics rather than the generic, and more abstract concepts of ability, effort, or luck. The specificity of the pilot attributional data raised the possibility that children's attributions, which are elicited by open-ended questioning techniques, are conceptually distinguishable from the generic attributional categories on which the attributional analysis of learned helplessness is based. Some support for this argument is found in the work of Diener and Dweck (1978) and Nicholls (1978) where task-oriented verbalizations are distinguished from causal attributions in problem-solving situations. An appropriate test of the global-specific hypothesis did not, therefore, seem tenable on the basis of the pilot study.

Open-ended questions are more likely to yield situationally-specific responses than the forced-choice procedures of the earlier attribution studies (e.g., Andrews & Debus, 1979; Butkowsky & Willows, 1979; Dweck, 1975). By adopting the open-ended questioning technique in the main study, it was felt that procedures which tap children's cognitions of specific successes and failures would provide a sounder basis for understanding the processes of change than would the use of global measures which inadequately reflect the contingencies of the experimental situation.

In view of the salience of self-monitoring and self-instructions for mastery-oriented children (Diener & Dweck, 1978) and the passivity of learning disabled children's task strategies (Torgesen, 1977), it was expected that normally achieving children would be more task-oriented than learning disabled children. In the light of the specific strategy-oriented responses which were evoked by the attribution question in the pilot study, it was expected also that the causal attributions of normally achieving children would be more strategy-oriented than those of learning disabled children. Accordingly, the following hypothesis was formulated.

Hypothesis 3. Normally achieving children will attribute failure to the adoption of specific task strategies more frequently than will learning disabled children.

CHAPTER FOUR

METHOD

Subjects

Sixty fourth-grade boys from eight Edmonton Public School Board schools serving predominantly middle class areas, participated in the study. Two groups were included: 30 boys who were currently receiving part-time placement in resource rooms and 30 normally achieving boys who were randomly selected from the same regular classrooms as the resource room boys. Placement in resource rooms had been made on the basis of normal intelligence and 1 1/2 or more years deficiency in reading and/or language achievement. In accordance with the criteria defined by Lerner (1976) the resource room boys were designated the learning disabled group. Resource room boys with serious emotional or English-as-second-language problems, or who were awaiting full-time special class placement, and regular class boys who had repeated a grade or received prior resource room placement were not included in the study. Descriptive data for learning disabled (LD) and normally achieving (NA) groups are presented in Table 1.

Chronological ages, and father's socioeconomic status at time of enrolment did not differ significantly for the two groups. Socioeconomic status was obtained from the Blishen Scale, a socioeconomic scale for occupations in Canada (Blishen, 1967). Learning disabled boys had obtained significantly lower verbal scores on the

Table 1

Descriptive Characteristics[a] of Learning Disabled and Normally Achieving Boys

	LD (n = 30)		NA (n = 30)		
Variable	M	SD	M	SD	t[b]
Age in months	116.13	6.95	113.43	5.47	1.6[illegible]
Socioeconomic status	4[illegible].39	12.46	41.[illegible]	8.97	0.30
Cdn. Cognitive Abilities Test					
Verbal	94.33	8.99	107.67	7.55	6.22*
Quant.	96.9[illegible]	10.58	102.58	14.76	1.77
Nonverb.	9[illegible].60	11.71	100.80	14.86	1.51
Grade Point Average	2.86	0.60	3.47	0.49	4.23*

* $p < .001$
a **Mean** values were inserted for missing data.
b df = 58

Canadian Cognitive Abilities Test (CCAT-Thorndike, Hagen, & Wright, 1974), in Grade 3 ($\bar{X}$(LD) = 94.33; $\bar{X}$(NA) = 107.67, $t(58) = 6.22$, $p < .001$), but quantitative and nonverbal scores did not differ significantly. School achievement, which was assessed by Grade Point Averages obtained from end-of-year report card grades in Grade 3, also differed significantly ($\bar{X}$(LD) = 2.86; $\bar{X}$(NA) = 3.47; $t(58) = 4.23$, $p < .001$), indicating a generally lower level of achievement for LD boys. For this analysis school grades were converted to a 5-point metric with the range 5 (A or Excellent) to 1 (E/F or Inadequate).

The Experimental Design

The four phases of the study are illustrated in Figure 1. The LD and NA subjects were randomly assigned to one of three conditions: tutor-assistance, self-instructional and no-training, to form a 2 x 3 factorial design. Phase 1 comprised the experimental induction of helplessness through the administration of the Failure Task to all subjects. Phase 2 was the training phase which exposed the two training groups to successful experiences of coping with failure and the no-training (control) group to a neutral task. Phase 3 tested for helplessness effects on immediate task performance with the administration of the Success Task to all subjects. Phase 4 attempted to assess the generality of helplessness and training effects with an optional task designed to measure continuing motivation.

Tasks

Failure Task. The Failure Task consisted of two solvable and six unsolvable network puzzles. Each network was a line diagram approximately 4 cm square. The two solvable networks had been selected on the basis of pilot data which indicated they were of realistic difficulty level for [illegible]-year-olds requiring a mean time of 48.10 seconds to reach a solution. The unsolvable networks were constructed with an equal number of lines to the solvable puzzles to equate them for perceived difficulty. Subjects were required to trace all lines without retracing a line or lifting their pencil. A copy of the Failure Task is presented in Appendix A.

Training Task. The materials for the training task consisted of 27 attribute cards which varied according to the attributes of shape,

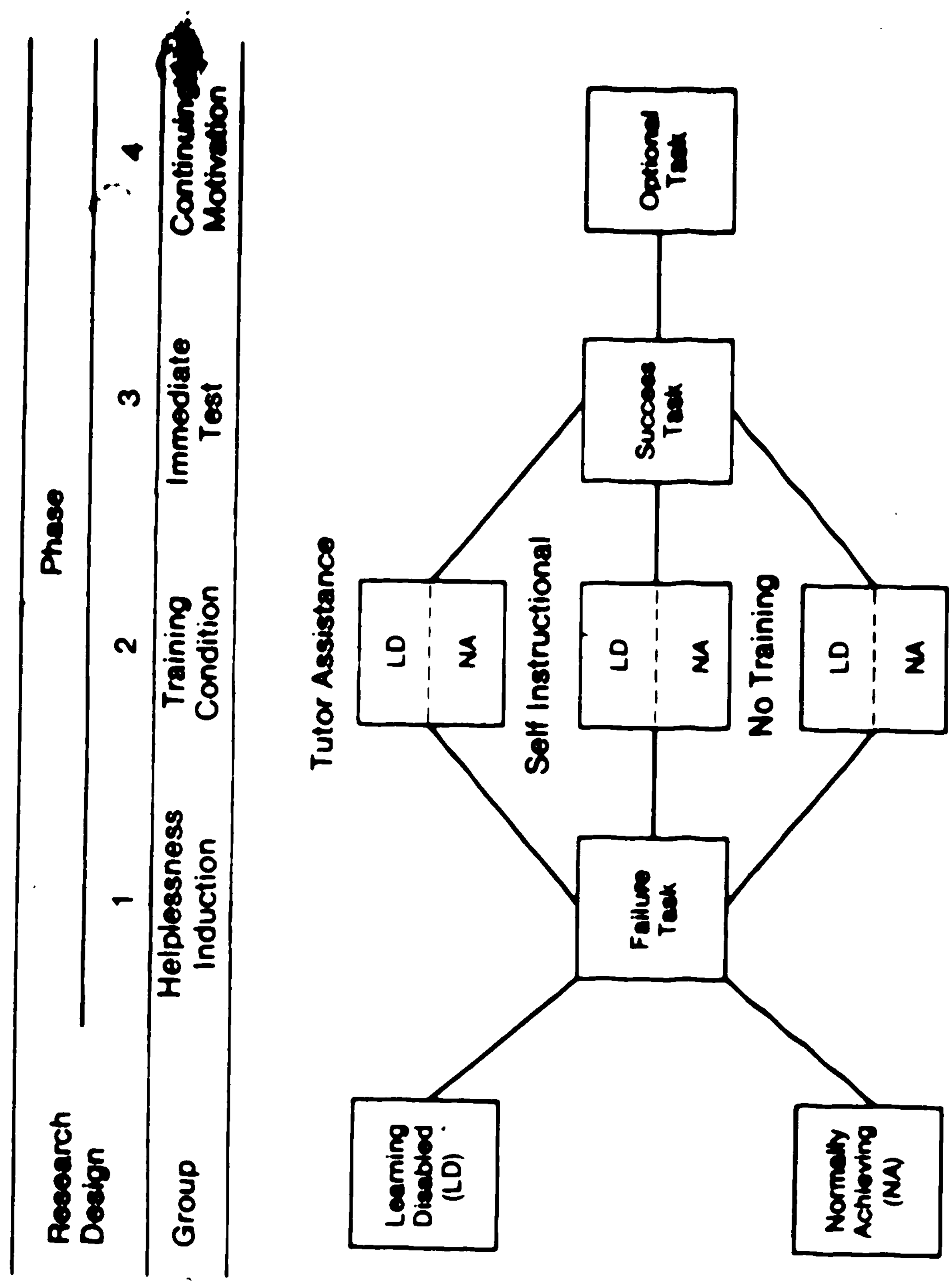

Figure 1. Flow chart of research design.

color, and number of objects. On each training problem subjects were required to form a logical sequence by completing a set of five cards for which the first and last cards had been identified. To form a sequence it was necessary to link each card to the previous card by two common attributes. For example, the attributes of shape and color could be maintained and the attribute of number of objects varied. Initial failure on the training problems was manipulated by presenting each problem as a timed task. Following interruption, which constituted failure on the problem, the training conditions were introduced. The tutor-assistance condition provided direct help from the experimenter while the self-instructional condition directed the child to refer to a set of cue cards as an aid to task solution. The cue cards corresponded to the three attributes of shape, color, and number of objects. The materials for the Training Task and instructions for their use are presented in Appendix B.

Success Task. The Success Task consisted of six tangram puzzles which involved the manipulation of five pieces: four triangles and a parallelogram, to reproduce a series of shapes. Pilot testing had indicated that the puzzles were of an intermediate difficulty level requiring an average time of 110 seconds to reach a solution. Materials for the Success Task are illustrated in Appendix C.

Optional Task. The Optional Task, presented at the end of the experimental procedures, was used to assess continuing motivation for the two experimental tasks on which the subjects had worked independently (i.e., the Failure and Success tasks). The subjects were asked, if they wished, to choose one of three options which they could take home for a spare time activity. The first option comprised a booklet of network puzzles similar to the Failure Task, the second option a booklet of tangram puzzles similar to the Success Task, and the third a small note pad [illegible] by [illegible] cm. Following pilot testing with several possible activities for the third option, the pad had been selected as a neutral activity with an intermediate level of attractiveness for nine-year-old boys. The materials for the Optional Task were equated for color and dimensions. The first two choices were expected to indicate continuing motivation for the puzzles and the third choice to indicate generality of helplessness effects. The Optional Task puzzles are presented in Appendix [illegible].

Dependent Variables

Helplessness effects. The presence of helplessness effects on immediate task performance was assessed by three performance measures: (1) the number of correct solutions on the Success Task, (2) the number of Success Task problems from which the child withdrew, or gave up, prior to solution, and (3) the mean time per problem on the Success Task.

Continuing Motivation. The presence of continuing motivation was assessed from the number of continuing motivation choices and the number of noncontinuing motivation choices on the Optional Task. Since the majority of the continuing motivation choices ([illegible]%) favored the tangram puzzles, the network and tangram puzzles were combined for the data analysis.

Attributions. Following both the Failure and Success tasks, children's attributions for failure were elicited by the question

"Why do you think you had trouble solving the puzzles? " .Pilot data had indicated that a significant number of "don't know" responses would occur in response to the attribution question. Consequently, two probe questions were also included as a further attempt to elicit perceptions of task performance. The first probe question asked "What did you think about when you were stuck on a puzzle?" and the second question, "Why did you give up before solving some of the puzzles? " Subjects who successfully completed all the Success Task puzzles were asked the first probe question instead of the attribution question.

All responses were tape recorded and subsequently coded into categories derived from the pilot data. Interjudge reliability was established separately, for each category, and for the Success and Failure tasks, by two independent judges. Per cent agreement ranged from 85% to 100% for the separate categories and was 94% overall. The coding categories were as follows:

1. Personal strategy. The subject referred to his own responsibility for failure usually with reference to a specific action or strategy related to task performance.

2. Task difficulty. The subject attributed failure to the difficulty level of the task.

3. Time. The subject attributed failure to insufficient time.

4. Don't know. The subject failed to respond or said that he did not know.

The first three categories were regarded as attributional responses. A personal strategy attribution combines an internal attribution (ability) with an external attribution (task requirement) and implies personal responsibility for the adoption of a specific task strategy. Attributions to task difficulty and time are external. Examples of the responses and criteria for coding are included in Appendix E.

In the case of the probe questions a small number of internal attributions (ability or effort) were recorded. Separate reliability estimates were not established for the internal attributional responses because of their infrequent occurrence but consultation about each response indicated 100% agreement.

Descriptive Variables

Spontaneous verbalizations. Since spontaneous verbalizations are indicative of helpless and mastery-oriented behaviors (Diener & Dweck, 1978), spontaneous verbal data were gathered for interpretive purposes. All spontaneous verbalizations from the Failure and Success tasks were tape recorded and subsequently coded into categories derived from pilot data. Interjudge agreement ranged from 75% to 100% for the separate categories and was 85% overall. Of the total number of verbalizations, 13% were dropped from the analysis because of lack of agreement. Subsidiary categories were grouped into three major categories.

1. Success-oriented verbalizations. Self-monitoring statements, self-instructions, statements of task completion, and statements of positive affect.

2. Failure-oriented verbalizations. Task-irrelevant statements, statements of task difficulty, statements expressing withdrawal from the task, and statements of negative affect.

3. Questions. Task-related questions.

Further details of the coding categories and examples of each category are presented in Appendix F.

Behavioral observations. An attempt was made to assess the effectiveness of the helplessness induction procedures by observing each subject's spontaneous behaviors during the helplessness induction (Phase 1) and immediate test phase (Phase 3). An event-sampling procedure was used to record noises, gestures, and looking at the examiner. Subsequent data analyses, however, indicated extreme variability of response and an absence of group or condition effects. Consequently, the behavioral observational data were eliminated from the analysis and presentation of results. In view of this strong individual difference factor in the behavioral data, future investigations of the relationship of spontaneous behaviors to learned helplessness may need to develop more sensitive indices of the behavioral manifestations of learned helplessness.

Procedures

All measures were individually administered by the investigator. Each subject was taken to a small room containing a table and two chairs, and was seated at one end of the table facing the investigator. All behavioral and performance data were recorded on separate record sheets for the Failure and Success tasks. All verbal data were tape recorded and timed data recorded with the aid of a stopwatch.

To introduce the procedures the subject was told that the experimenter was interested in how boys his age solved problems, and that he would be asked to solve some puzzles. To elicit perceptions of the puzzles as problems but at the same time maintain a nonthreatening atmosphere the instructions continued as follows.

> Puzzles are like problems and I want you to think about them just as you would when you are solving a problem. Some of the puzzles are like problems you work out at school and some are like puzzles you can do in your spare time at home.

Phase 1 was introduced with a description of the network puzzles which constituted the Failure Task. The experimenter demonstrated how to trace a network without retracing a line or lifting the pencil, and how to start on another copy of the puzzle if a mistake occurred. In an attempt to elicit spontaneous verbalizations from the subject the demonstration trial included modeling of self-instructions and self-monitoring statements by the examiner. The subject was then given a practice trial with a second solvable network. Each network was presented with duplicate copies in a pile about 1 1/2 cm thick.

The two solvable and six unsolvable puzzles were placed in front of the subject so that the solvable puzzles would be attempted first, and the following instructions given.

> There are eight network puzzles here for you to do. Start with the first pile and when you have finished move to the next pile. If you have trouble with a network you can leave it but you must not go back to it again. Children your age usually need about 10 minutes to solve them all so I will tell you to stop after 10 minutes. Start now.

If an incorrect solution was given the subject was told "No, that is wrong. Do you want to keep trying or move on to the next puzzle? " If the subject persisted with an unsolvable puzzle for three minutes he was reminded that he could move on to another puzzle if he wished. The three minute prompt was included on the basis of the pilot data which had indicated extreme variability in task persistence. Following completion of the Failure Task the subject's causal attributions for failure were elicited by asking him why he thought he had trouble solving the puzzles.

Phase 2 comprised the training conditions. Both training conditions were introduced with the words "The next puzzles are called sequences. This time if you have trouble solving the puzzle you can do something to help yourself work it out." The attribute cards were then spread out in front of the subject and the attributes identified by the examiner. For the tutor-assistance condition, the examiner demonstrated how to form a sequence by completing a training problem. A practice training problem card was then placed in front of the subject with the following instructions.

> Here is a sequence for you to practise with. If you are having trouble there is something you can do. You can ask me to check each card you choose to help you to work out the sequence.

Ten problem cards were placed in front of the subject. Problems 1 to 5 were failure trials for which failure was manipulated by interruption after 20 seconds. Problems 6 to 8 did not manipulate failure but maintained the training condition, tutor-assistance and feedback. Problems 9 to 10 were success trials and eliminated the tutor-assistance condition providing only knowledge of results upon completion.

Following interruption, the subject was told that he had exceeded the time usually taken by children his age to select a card, and the correct card was identified by the examiner. If an incorrect move was made the error was pointed out and the subject reminded how to check the attributes. After the completion of each training problem the sequence was checked by the examiner and the subject told "Good. You've found a way to work out the sequence."

The self-instructional training condition maintained the same order of presentation for demonstration, practice, and training problems but differed in the nature of the instruction and the type of activity engaged in by the child to reach a solution. For the demonstration trial, the examiner modeled the use of the cue cards as prompts to check the three attributes, and for checking each card after it had been placed in position. The modeling also included verbal self-instructions and verbal checking of the solution. The practice trial was introduced with the following instructions.

> Here is a sequence for you to practise with. If you are having trouble there is something you can do. You should check the cue cards to help you to work out the sequence.

Following the interruption, the subject was reminded to check the cue card and following an incorrect move he was told that he had failed to check the cue cards. After the completion of each training problem the subject verbally checked his solution and was told "Good. You've found a way to work out the sequence."

Subjects in the no-training condition were told that the experimenter had some things to sort out for the next puzzle and that they could use some cards for a while. The attribute cards from the Training Task were given to the subject who was then left to work independently. While the subject was using the cards the experimenter unobtrusively recorded the nature of the activity engaged in with the materials. When an equivalent time to the training period had elapsed the subject was told that the experimenter was nearly ready and that he could put the cards together again. To ensure that an equivalent amount of experimenter-subject interaction was experienced across the three conditions the experimenter chatted briefly with the subject about school activities before proceeding with Phase 3.

Phase 3 assessed helplessness effects on the Success Task. The tangram puzzles were introduced with a demonstration of the correct solution for a 4-piece tangram, and a practice trial with a second 4-piece tangram was given. The six 5-piece tangram puzzle cards were placed in front of the subject with the following instructions.

> There are six tangram puzzles here for you to do. Start with the first puzzle and when you have finished move to the next puzzle. If you have trouble with a puzzle you can leave it but you must not go back to it again. I haven't tried these puzzles with many children your age so I don't know how long it needs to solve them but we'll try 10 minutes. Start now.

The final reference to the absence of normative data was an attempt to present the Success Task in a nonthreatening light and to minimize any negative effects arising from the 10 minute time limit. In particular, it was hoped that the presentation of the Success Task in this way would reduce automatic comparisons between the Failure and Success tasks. A 10 minute time limit was imposed on both tasks to permit comparison of the observational data.

When the 10 minutes had elapsed the subject was stopped and the examiner demonstrated the solution of the last puzzle to reduce the possibility of a Zeigarnik effect (Butterfield, 1964; Van Bergen, 1968) which could interfere with the subsequent use of the tangrams as a measure of continuing motivation. The subject's causal attributions were then recorded.

Phase 4 used the Optional Task to assess continuing motivation. After the completion of the Success Task the subject was told that, if he wished, he could choose one of three things to take home to use in his spare time, some more networks, some more puzzles, or a note pad. The examiner indicated the booklet of networks, the booklet of tangrams, and the pad, and told the subject he could choose one and place it in an envelope. While the subject was making a choice the examiner occupied herself with the experimental materials in an attempt to reduce perceptions of surveillance. When the subject was ready the experimenter said that she would keep the envelope until she had finished at the school and would then give it to the classroom teacher. In order to reduce the possibility that subjects would discuss the experimental procedures with children who had still to be seen, each subject was asked not to talk about the puzzles with other children until he had received his envelope from the classroom teacher.

All children were thanked for their participation and told that they had performed very well on some difficult puzzles. To reduce any negative effects resulting from the experimental procedures, subjects in the no-training condition who had not experienced success in coping with failure were given two solvable network puzzles to solve as they were about to leave. The networks were described by the examiner as puzzles which she had not tried out with other children and the boys were asked if they could spend a few minutes trying them out before they returned to their classrooms. In each case the puzzles were solved and the subject was told "You have really caught on to the puzzles this time."

Predictions

The hypotheses, rephrased in terms of the operational definitions of the conceptual variables, were formulated as the following predictions.

Prediction 1a. Normally achieving boys who receive self-instructional training will (1) solve more problems on the Success Task, (2) give up fewer problems prior to solution on the Success Task, and (3) take less mean time per problem on the Success Task, than normally achieving boys who receive tutor-assistance training.

Prediction 1b. Learning disabled boys who receive tutor-assistance training will (1) solve more problems on the Success Task, (2) give up fewer problems prior to solution on the Success Task, and (3) take less mean time per problem on the Success Task, than learning disabled boys who receive self-instructional training.

Prediction 1c. Control boys who do not receive training will (1) solve fewer problems on the Success Task, (2) give up more problems prior to solution on the Success Task, and (3) take longer mean time per problem on the Success Task, than boys who receive training.

Prediction 2a. Normally achieving boys who receive self-instructional training will make more continuing motivation choices than normally achieving boys who receive tutor-assistance training.

Prediction 2b. Learning disabled boys who receive tutor-assistance training will make more continuing motivation choices than learning disabled boys who receive self-instructional training.

Prediction 2c. Control boys who do not receive training will make fewer continuing motivation choices than boys who receive training.

Prediction 3. Normally achieving boys will give more personal strategy attributions for failure on the Failure and Success tasks than will learning disabled boys.

Data Analyses

Three 2-way (group x condition) analyses of variance were carried out on the Success Task dependent variables, viz., (1) number of correct solutions, (2) number of problems given up prior to solution, and (3) mean time per problem. Hypotheses 1a and 1b were tested by planned orthogonal contrasts of the tutor-assistance and self-instructional means, for the LD and normally achieving groups. Hypothesis 1c was tested by planned orthogonal contrasts of the control group mean and the average of the two training conditions, combining the LD and normally achieving subjects for the analysis. In addition, individual cell comparisons were carried out by the Dunnett test, a specialized multiple comparison procedure for use when comparisons are limited to control-experimental contrasts (Winer, 1971).

Chi-square procedures were used to test hypotheses two and three. Individual cell comparisons were carried out by the Z test for the significance of differences between proportions (McNemar, 1969). In addition, the attributional data were analyzed by the McNemar test for the significance of changes (McNemar, 1969).

Several ancillary analyses were carried out. Because of heterogeneity of variance considerations, spontaneous verbal data were dichotomized at the median and analyzed by the Median test (McNemar, 1969). The mean time per problem for the success trials and for the failure trials on the Failure Task were analyzed with t tests to determine any performance differences between [illegible] and normal achievers prior to the training phase (Phase 2).

Uses of the attribute cards by the no-training control subjects were coded into active and passive uses and analyzed by the chi-square test. Active uses included classifying the cards by their attributes, and creating designs based on the attributes. Passive uses included spreading the cards on the table and then packing them up again immediately, and looking through the pack of cards without any attempt to reorder or classify the cards. Interjudge agreement for the two categories was 100%. All tests of significance used in the data analyses were 2-tailed.

CHAPTER FIVE

RESULTS AND PRELIMINARY DISCUSSION

The first research hypothesis that successful experiences of coping with failure will reverse learned helplessness was tested from performance on the three Success Task dependent variables. Consideration will be given initially to the results of the three separate analyses and then to an integration of the findings from the three analyses.

Table 2 presents means, standard deviations and F ratios for the mean number of correct solutions on the Success Task. Figure 2 plots the means for the LD and normally achieving groups as a function of a training condition. A condition effect was obtained ($F(2,54) = 3.068$, $p < .055$) but there were no significant group or interaction effects. The planned orthogonal contrasts of the two training conditions failed to yield significant differences between the tutor-assistance and self-instructional conditions for either the LD or normally achieving groups. When the training conditions were compared with their controls by the Dunnett test the source of the condition effect was revealed as a significant difference between the tutor-assistance and no-training conditions ($\bar{X}$(LD-TA) = 4.4; $\bar{X}$(LD-NT) = 2.8; $t(3,54) = 2.555$, $p < .05$) for the LD children. The self-instructional mean did not differ significantly from the no-training mean for the LDs. Neither condition-control comparison was significant for the normally achieving groups.

Table 2

Means, Standard Deviations and F Ratios for Mean Number of Correct Solutions on the Success Task

Source	df	MS	F	p
Group (A)	1	.817	< 1.0	[illegible]
Condition (B)	2	6.017	3.068	.05
AB	2	3.717	1.895	.160
Within	54	1.961		

	Tutor Assistance		Self Instructional		No Training	
	M	SD	M	SD	M	SD
LD	4.4	1.265	3.3	1.567	2.8	1.033
NA	3.7	1.703	4.3	1.059	3.2	1.619

Means, standard deviations and F ratios for the number of problems given up prior to solution on the Success Task are reported in Table 3. Figure [illegible] plots the means for the LD and normally achieving groups as a function of training condition. A significant interaction of group and condition was obtained ($F(2,54) = 3.857$, $p < .027$). A marginal main effect for group was observed ($F(1,54) = 3.179$, $p < .08$), but there was no main effect for condition. The planned orthogonal contrasts of the two training conditions revealed a significant difference between tutor-assistance and self-instructional training for the LDs ($\bar{X}$(LD-TA) = 0.6; $\bar{X}$(LD-SI) = 1.7; $F(1,54) = 5.127$, $p < .05$),

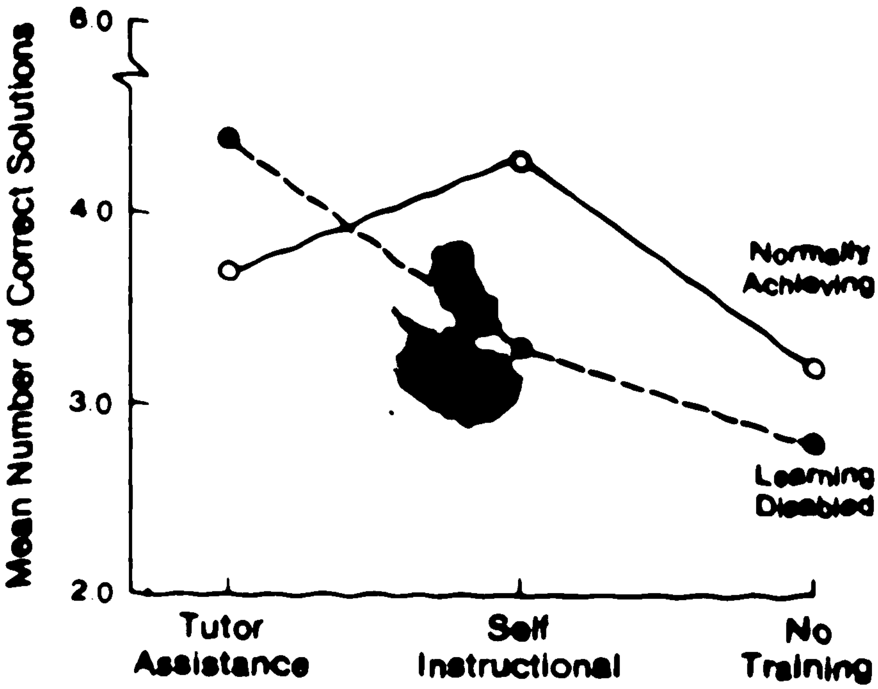

Figure 2. Mean number of correct solutions on the Success Task as a function of training condition.

with LDs in the tutor-assistance condition giving up fewer problems prior to solution than LDs in the self-instructional condition. Dunnett comparisons indicated further that LD boys in the tutor-assistance condition gave up fewer problems prior to solution than their no-training controls ($\bar{X}$(LD-TA) = 0.6; $\bar{X}$(LD-NT) = 1.8; $t(3,54) = 2.471$, $p < .05$). Normally achieving boys who received tutor-assistance or self-instructional training did not differ significantly from their no-training controls in the number of problems given up prior to solution but tests of the simple group effects indicated that the normal achievers gave up less frequently than LDs in both the self-instructional ($\bar{X}$(NA-SI) = 0.6; $\bar{X}$(LD-SI) = 1.7; $F(1,54) = 5.129$, $p < .05$) and no-training ($\bar{X}$(NA-NT) = 0.8; $\bar{X}$(LD-NT) = 1.8; $F(1,54) = 4.239$, $p < .05$) conditions.

Table 3

Means, Standard Deviations and F Ratios for

Mean Number of Problems Given Up Prior to

Solution[a] on the Success Task

Source	df	MS	F	p
Group (A)	1	3.750	3.179	.080
Condition (B)	2	.817	< 1.0	.505
AB	2	4.550	3.857	.027
Within	54	1.180		

	Tutor Assistance		Self Instructional		No Training	
	M	SD	M	SD	M	SD
LD	0.6	.699	1.7	1.159	1.8	1.135
NA	1.2	1.399	0.6	.966	0.8	1.033

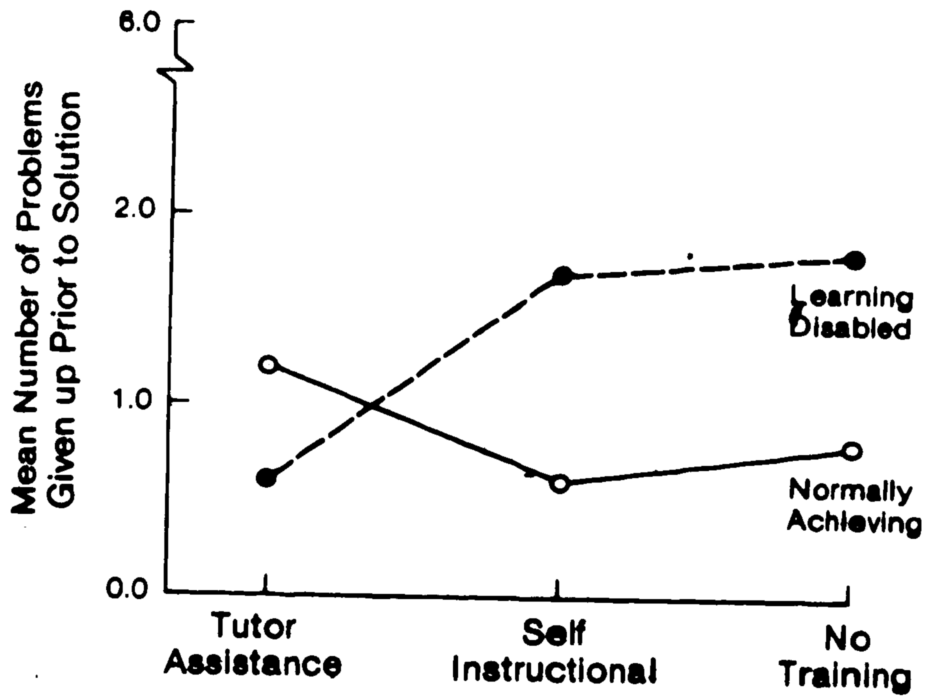

Figure 3. Mean number of problems given up prior to solution on the Success Task as a function of training condition.

Table 4 reports a condition effect for the mean time per problem on the Success Task ($F(2,54) = 3.142$, $p < .051$). There were no significant group or interaction effects. The means for the LD and normally achieving groups are plotted in Figure 4. The planned orthogonal contrasts of the training condition means failed to reveal significant differences between self-instructional or tutor-assistance training for either the LD or normally achieving groups. Comparisons of the training conditions with their no-training controls by the Dunnett test revealed a significant effect for the normally achieving group. Normally achieving boys in the no-training condition took longer time per problem when compared with normal achievers in the self-instructional condition ($\bar{X}$(NA-NT = 137.989; $\bar{X}$(NA-SI) = 100.017; $t(3,54) = 2.639$, $p < .05$). The effectiveness of self-instructional training for reducing the mean time per problem of the normally achieving boys was, however, qualified by a marginally significant difference between the tutor-assistance and no-training means ($\bar{X}$(NA-TA) = 106.099; $\bar{X}$(NA-NT) = 137.989; $t(3,54) = 2.216$; $p < .06$). When this marginal effect is taken into account, tutor-assistance training was nearly as effective as self-instructional training for reducing the mean time per problem with normally achieving boys. For the LDs, neither the self-instructional or tutor-assistance boys differed significantly from their no-training controls for the mean time per problem on the Success Task.

To integrate the results of the three Success Task analyses, the performance of the LD and normally achieving boys will be considered separately in terms of the significant effects for each of the two

Table 4

Means, Standard Deviations and F Ratios for

Mean Time per Problem on the Success Task

Source	df	MS	F	p
Group (A)	1	539.398	< 1.0	.474
Condition (B)	2	3252.738	3.142	.051
AB	2	1245.030	1.203	.308
Within	54	1035.268		

	Tutor Assistance		Self Instructional		No Training	
	M	SD	M	SD	M	SD
LD	109.956	34.400	102.367	25.348	113.792	27.521
NA	106.099	28.297	100.017	28.965	137.989	44.590

groups. For LD boys, tutor-assistance training was more effective than self-instructional training for reducing the number of problems given up prior to solution (see Figure 3) but significant differences did not occur for either the number of correct solutions or the mean time per problem. Thus, in terms of one of the three Success Task dependent variables the data support the hypothesis (1b) that tutor-assistance training will be more effective than self-instructional training for reversing learned helplessness in learning disabled boys. In addition, comparisons of the two training conditions with the no-training control condition yielded significant effects for the

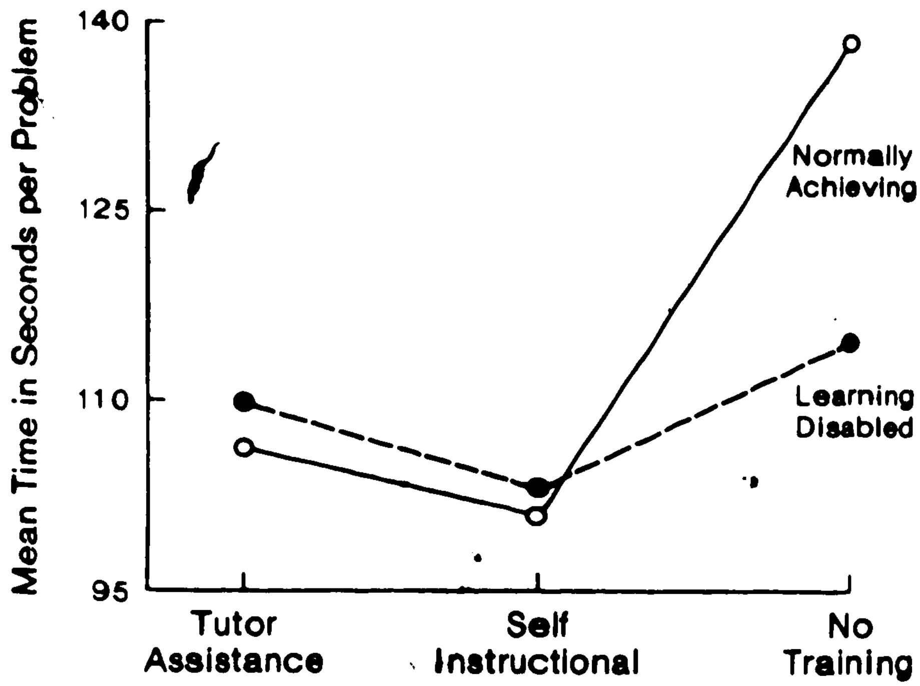

Figure 4. Mean time per problem on the Success Task as a function of training condition.

number of correct solutions (see Figure 2) and the number of problems given up prior to solution (see Figure 3), with LDs in the tutor-assistance condition solving more problems and giving up less frequently than their no-training controls. The effective performance on two of the three Success Task dependent variables of the LD boys who received tutor-assistance training, relative to their no-training controls, provides further support for the effectiveness of tutor-assistance procedures for reducing learned helplessness in learning disabled boys.

For normally achieving boys, significant differences between tutor-assistance and self-instructional training were not obtained for the three Success Task dependent variables. Consequently, the hypothesis (1a) that self-instructional training will be more effective than tutor-assistance training for reversing learned helplessness with normally achieving boys does not seem tenable. Subsequent comparisons of the two training conditions with the no-training control condition did, however, reveal a significant effect for the mean time per problem on the Success Task (see Figure 4) with normally achieving boys without training taking more time per problem than normal achievers in the self-instructional condition. When the marginally significant difference between the tutor-assistance and no-training groups is considered as well it is evident that the data provide only slight support for the effectiveness of self-instructional procedures for reducing learned helplessness in normally achieving boys.

To test the hypothesis (1c) that children who do not receive training will exhibit learned helplessness, planned orthogonal contrasts between the no-training group and the average of the two trained groups were carried out for the three Success Task dependent variables. Significant effects were obtained for two of the three Success Task dependent variables with the untrained boys solving fewer problems than the trained boys ($\bar{X}$(NT) = 3.0; $\bar{X}$(trained) = 3.925; $F(1,54) = 4.63$, $p < .05$) and taking longer mean time per problem ($\bar{X}$(NT) = 125.891; $\bar{X}$(trained) = 104.61; $F(1,54) = 4.375$; $p < .05$). Hypothesis 1c was, therefore, supported in terms of two of the three Success Task dependent variables.

In view of the obtained group by condition interaction for the number of problems given up prior to solution on the Success Task, it is plausible to assume that the LDs and normal achievers were reacting differently to the experimental manipulations. Consequently, the results for the LD and normally achieving groups, which are reported in Tables 2, 3 and 4, were also examined in terms of the expected helplessness effects. As expected from a helplessness perspective, LDs without training obtained fewer correct solutions ($\bar{X}$(LD-NT) = 2.8; $\bar{X}$(LD-TA) = 4.4; $t(3,54) = 2.555$, $p < .05$), and gave up more frequently ($\bar{X}$(LD-NT) = 1.8; $\bar{X}$(LD-TA) = 0.6; $t(3,54) = 2.471$, $p < .05$) than LDs who received tutor-assistance training. Contrary to expectation, the LD boys who did not receive training failed to take more time per problem than their trained counterparts. When the greater tendency of the LD controls to give up on a problem is considered as well, however, it is plausible to reinterpret this failure to take longer on the problems as a failure to persist with a task once a solution is not readily apparent. In the context of their performance on the first two dependent variables, therefore, the LD controls' deficiency in task persistence may be viewed as a manifestation of learned helplessness.

A contrasting pattern of behavior is apparent when the Success Task performance of the normally achieving boys who did not receive training, is considered. In comparison with their trained counterparts, the untrained normal achievers did not differ in the number of correct solutions or number of problems given up prior to solution. Thus, in terms of their performance on the first two Success Task dependent variables, the prediction that boys without training would exhibit helplessness effects was not supported. When the training conditions were compared with the no-training condition, for the normal achievers, the expected longer time per problem was observed ($\bar{X}$(NA-NT) = 137.989; $\bar{X}$(NA-[illegible]) = 100.017; $t(3,54) = 2.639$, $p < .05$). In terms of the mean time per problem, therefore, the expected helplessness effects were apparent in the Success Task performance of the normally achieving controls. When the increased time of the untrained normal achievers is considered in the context of their performance on the first two dependent variables it is evident that these children persisted with the problems to obtain the same number of correct solutions as the normally achieving trained boys. Consequently, when their overall performance on the Success Tasks is taken into account, the evidence for the presence of helplessness deficits with normally achieving boys who did not receive training is very slight.

Continuing motivation choices failed to support the <u>second research hypothesis</u> that training conditions which differentially emphasize the role of external and personal resources for coping with failure will differentially influence continuing motivation. Frequencies for continuing motivation and noncontinuing motivation choices are reported in Table 5. Normally achieving boys who received self-instructional training failed to make more continuing motivation choices than normally achieving boys who received tutor-assistance training ($X^2(1) < 1.0$, NS; Hypothesis 2a), and LD boys who received tutor-assistance training did not make more continuing motivation choices than LD boys who received self-instructional training ($X^2(1) < 1.0$, NS; Hypothesis 2b). Furthermore, boys without training did not differ significantly in their continuing motivation choices from boys who received training ($X^2(1) < 1.0$, NS; Hypothesis 2c).

Table 5

Frequency of Continuing Motivation Choices for each Training Condition[a]

		Continuing Motivation	Non-Continuing Motivation	X^{2b}
LD	Tutor Assistance	9	1	4.9*
	Self Instructional	5	5	
	No Training	6	4	0.1
NA	Tutor Assistance	6	4	0.1
	Self Instructional	5	5	
	No Training	9	1	4.9*

* $p < .05$

a n = 10

b Corrected for continuity, df = 1

When continuing motivation and noncontinuing motivation choices were compared within each condition, however, significant differences were observed. For these comparisons a chi-square test of the equality of frequencies falling into the two categories was carried out. LD boys who received tutor-assistance training made more continuing motivation than noncontinuing motivation choices ($X^2(1) = 4.90$, $p < .05$). Significant differences were not obtained for the LD boys within either the self-instructional or no-training conditions. Normally achieving boys who did not receive training made more continuing motivation choices than noncontinuing motivation choices ($X^2(1) = 4.90$, $p < .05$). Normal achievers did not differ significantly within the two training conditions.

Although significant between group differences were not obtained, the finding that LDs who received tutor-assistance training showed more subsequent interest in the Success Task tangram puzzles than in an alternative activity is consistent with the hypothesis (2b) that tutor-assistance training would have a more positive influence on the continuing motivation of LD children than would self-instructional training. In contrast, the finding that normally achieving boys without training made more continuing motivation than noncontinuing motivation choices is clearly inconsistent with the expectation that children who develop learned helplessness would not develop continuing motivation (Hypothesis 2c). The continuing motivation shown by the untrained normal achievers may be a further indication of the specificity of helplessness effects among normally achieving children. In the case of the untrained normal achievers, impaired task performance on the Success

Task did not depress subsequent interest in the tangram puzzles, the predominant continuing motivation choice.

With regard to the continuing motivation choices, the negligible selection (2 NAs, 1 LD) of the network puzzles similar to the Failure Task is of interest. The findings of earlier repetition choice studies (e.g., Butterfield, 1965; Crandall & Rabson, 1960) would suggest that success-striving children tend to select the task on which they had previously failed (i.e., the Failure Task network puzzles). In the present study, however, it is highly probable that the unsolvable network puzzles would be perceived as considerably more difficult than the tangram puzzles which, in addition to their solvability, were designed to be of an intermediate difficulty level. Since recent studies (e.g., Young & Egeland, 1976) have also indicated that perceived difficulty level is a critical factor affecting children's repetition choices, the choice of the tangram puzzles as the predominant continuing motivation choice in the present findings is not unexpected.

The <u>third hypothesis</u> that normally achieving children will attribute failure to the adoption of specific task strategies more frequently than will learning disabled children received some support from the attribution data. The adoption of task strategies was examined in terms of the use of personal strategy attributions which reflected the integration of personal task strategies with problems posed by the task.

As indicated in Table 6, responses to the attribution question "Why do you think you had trouble solving the puzzles?" on the Failure

Task did not differ significantly for the LD and normally achieving groups. Personal strategy attributions (e.g., I either started on the wrong spot or I didn't figure out the way) and task difficulty attributions (e.g., They were kind of tough) were made by both LD and normally achieving boys, and don't know responses were frequent (50% for LDs; 40% for NAs). Significant differences in the LD and normal achievers' use of the personal strategy attribution did, however, appear in response to the probe question "Why did you give up before solving some of the puzzles?" on the Failure Task. Table 7 indicates that 57% of normally achieving boys compared with 27% of the LDs gave personal strategy responses ($z = 2.355$, $p < .05$). Consequently, when the responses to the probe question are taken into account, the prediction that normally achieving students would use more personal strategy attributions than LDs is supported in terms of the Failure Task verbal data.

Table 6

Frequencies of Causal Attributions for Failure

on the Failure Task

Category	LD (n = 30)	NA (n = 30)
Personal strategy	7	11
Task difficulty	8	7
Don't know	15	12

$X^2 = 1.288$, df = 2, NS

Table 7

Frequences of Causal Attributions for Failure

in Response to the Probe Question

"Why did you give up before solving some of the puzzles?"

on the Failure Task[a]

Category	LD (N = 30)	NA (n = 28)	z
Personal strategy	8	16	2.[illegible]*
Task difficulty	7	4	
Time	8	[illegible]	
Don't know	7	7	

a Excludes [illegible] subjects who made incorrect solutions and did not give up.

χ^2 = 9.8[illegible], df = [illegible], p < .0[illegible]

* p < .0[illegible]

For the Success Task, responses to the attribution question "Why do you think you had trouble solving the puzzles?" also indicated the salience of personal strategy attributions for normally achieving boys. The data presented in Table 8 indicates that of the boys who failed on one or more of the six puzzles, 54% of the normals compared with 19% of the LDs gave personal strategy attributions (z = 2.[illegible]5, p < .05). As indicated in Table 9, when the attribution responses to the Success Task attribution question were examined within each condition only the no-training control groups showed significant differences in causal attributions for failure. Normally achieving boys who did not receive training made more personal strategy attributions (e.g., I tried to fit the big piece first but it didn't always fit) than task difficulty attributions (e.g., It was too hard for me). A reverse pattern was obtained with the LDs ($p < .05$, Fisher exact probability test).

Table 8

Frequencies of Causal Attributions for Failure on the Success Task[a]

Category	LD (n = [illegible])	NA (n = 24)	z[b]
Personal strategy	5	13	2.365*
Task difficulty	[illegible]	[illegible]	.836
Don't know	[illegible]	4	1.313

χ^2 = [illegible], df = [illegible], p < [illegible]

a Excludes [illegible] subjects who obtained six correct solutions.

b Corrected for continuity.

* $p < .05$

Table 9

Frequencies of Personal Strategy and Task Difficulty Attributions for Failure on the Success Task for each Training Condition

Category	Tutor Assistance LD	Tutor Assistance NA	Self Instructional LD	Self Instructional NA	No Training[a] LD	No Training[a] NA
Personal strategy	2	4	2	3	1	6
Task difficulty	4	2	2	4	6	1

a Fisher exact probability test, $p < .05$

In terms of the control groups' responses, the Success Task attribution data confirm that normally achieving boys tend to make more personal strategy attributions than learning disabled boys. The use of the personal strategy attribution, in turn, suggests that normal achievers are more willing than LDs to take responsibility for their failures.

In view of its exploratory nature, three subsidiary analyses of the attribution data were carried out. Data for the following analyses are reported in Appendix G. The first analysis examined verbal data from the boys who achieved correct solutions for all Success Task puzzles (6 NAs, 3 LDs). In response to the question "What did you think about when you were stuck on a puzzle?" eight of the nine successful boys referred to personal strategy cognitions (e.g., I was thinking if I could change the big one on the other side it might help) while one referred to renewed effort ($p < .05$, Binomial test). The successful boys' use of the personal strategy response is a further indication of the salience of strategy-oriented cognitions for effective task performance.

The second subsidiary analysis examined the responses to the probe question "What did you think about when you were stuck on a puzzle? " of the boys who had previously answered don't know to the attribution question. Of the children giving don't know responses on the Failure Task, 85% subsequently gave personal strategy or external attributional (task difficulty or time) responses while 15% maintained don't know responses ($X^2(1) = 13.37$, $p < .001$). Of the 85% who did not maintain the don't know response, more boys stated that they were thinking about strategies for solving the puzzles than about external attributions for failure ($X^2(1) = 7.348$, $p < .01$).

A similar use of strategy-oriented cognitions was reported by the 14 boys who responded don't know to the attribution question on the Success Task. Of the 14 boys, 86% subsequently gave personal strategy or internal attributional (effort or ability) responses to the question "What did you think about when you were stuck on a puzzle?" ($X^2(1) = 5.786$, $p < .02$). Of these bo[illegible]rginally significant majority ($p < .066$, Binomial test) favor[illegible]sonal strategy over internal attributional responses.

In sum, the subsequent verbal responses of the boys who initially responded don't know to the attribution question on the Failure and Success tasks, may be a further indication that specific strategy-oriented cognitions, rather than generic causal attributions, are an important aspect of children's problem-solving strategies.

The final subsidiary analysis of the attributional data examined changes in attributions from the Failure Task to the Success Task. The McNemar test for the significance of changes failed to reveal significant differences in attributions between the Failure and the Success tasks. Thus the attribution data provided no support for the theoretical proposal (Abramson et al., 1978) that success modifies attributions along a global-specific dimension. The failure of training to produce attributional change may have arisen from the brevity of the experimental procedures. A further consideration is that situational rather than global attributions were of more significance for task performance in the experimental situation. This explanation is supported by the frequency of specific strategy-oriented responses in the preceding analyses.

Finally, two ancillary analyses of the descriptive variables, which differentiate the learning disabled and normally achieving groups in terms of their reactions to failure, are reported. Both sets of findings are relevant to the occurrence of helplessness effects in the learning disabled subjects in the present study.

Significant group differences were observed in the untrained control boys' use of the attribute cards in Phase 2 of the experiment. When the attribute cards were presented to the no-training boys as a neutral task, normally achieving boys made active, constructive use of the materials primarily by classifying the cards according to their attributes. In contrast, LD boys made passive use of the materials usually by looking at the cards and then leaving them in a stack ($p < .025$, Fisher exact probability test). The ability of the normally achieving untrained boys to involve themselves actively with an unstructured activity in the absence of tutor direction after a failure experience, suggests that these children, in contrast to the LD controls, may have developed independent strategies for coping with failure.

The Median test yielded a significant chi-square for failure-oriented verbalizations on the Failure Task ($X^2(1) = 4.444$, $p < .05$). It is interesting to note that the less frequent use of failure-oriented verbalizations by the normally achieving children ($z = 2.108$, $p < .05$) is consistent with performance data for the Failure Task. A marginally significant difference for the mean time per problem on the unsolvable puzzles of the Failure Task ($\bar{X}(LD) = 114.609$; $\bar{X}(NA) = 135.774$;

$t(58) = 1.928$, $p < .059$) indicated that the normally achieving boys persisted longer with the puzzles although no such difference had been observed with the initial solvable puzzles on the Failure Task ($t(58) = 1.394$, $p < .169$). The early expression of undesirable reactions to failure on the Failure Task by the LD boys provides some indication that the prior history of failure of the LD subjects had generalized to the novel experimental task. If this assumption is valid it helps to explain the more marked manifestation of learned helplessness in the LD subjects on the Success Task when compared to the normal achievers.

CHAPTER SIX

DISCUSSION

Summary of the Major Findings

For learning disabled children, tutor-assistance training was more effective than self-instructional training for decreasing the number of problems on which the child gave up prior to solution. Learning disabled children who received tutor-assistance training also solved more problems and withdrew from the problems less frequently than learning disabled children who did not receive training.

The normally achieving children who received self-instructional training did not differ significantly in their problem-solving performance from normally achieving children who received tutor-assistance training. Normal achievers without training took more time per problem than those receiving self-instructional training and marginally longer than those receiving tutor-assistance training. These untrained children did not differ from the self-instructional or tutor-assistance groups in the number of problems solved or the number of problems given up prior to solution.

Continuing motivation was shown by learning disabled children who received tutor-assistance training and by normally achieving children without training. The normal achievers who did not receive training attributed failure to their personal problem-solving strategies while learning disabled children without training blamed the difficulty of the task for their failure to reach a solution.

Discussion of the Major Findings

The finding that LD children perform effectively and maintain motivation for an activity with direct tutor-assistance provides some support for the continued use of structured procedures in resource rooms. In the present study, tutor-assistance procedures directed the children toward the adoption of specific problem-solving strategies. The effectiveness of these procedures for overcoming the disruptive effects of failure with the LD children is consistent with the findings of other fields of research. In the context of information-processing theory, Resnick (1976) for instance, has claimed that differences in learning ability "may in fact be differences in the amount of support individuals require in making the simplifying and organizing inventions that produce skilled performance" (p. 76). The widespread findings of attentional deficiencies in LD students (Hallahan, 1975) may also argue for greater support in the development of integrative abilities with these children.

Learning disabled children with tutor-assistance training were able to maintain effective problem-solving strategies on the immediate test, a task of intermediate difficulty which provided a realistic challenge for the student. Egeland (1974) reported a similar effect when he trained impulsive children in the use of efficient scanning techniques. In this study, as long as the child did not perceive the task as too difficult he could use his newly acquired reflective approach. In view of Egeland's finding, the perceived difficulty level of the Success Task may have contributed to the ineffective performance of the LD children who received self-instructional training, which did not differ significantly from that of the untrained LDs. Self-instructional training provided an equivalent amount of information to aid task solution to that provided by tutor-assistance training. However, success with the training problems in the self-instructional condition did not generalize to the subsequent test task for the LD children. In this case, the greater emphasis the self-instructional procedures placed on personal resources may have elicited perceptions of task difficulty which generalized to the Success Task. An additional consideration arises from Mettee's (1971) finding that unexpected success is rejected by children with a history of failure. For the LD children, the apparent dependence of task solution on the self-instructional procedures may have evoked subjectively threatening cognitions which interfered with problem-solving behaviors on a subsequent task.

For normally achieving children, both self-instructional and tutor-assistance training were effective in minimizing lasting effects of exposure to failure. This result may be viewed in the light of the findings of aptitude-treatment interaction studies (Hunt, 1975) that students high in conceptual level often do as well in structured as in unstructured classrooms although they usually prefer unstructured settings. The greater verbal abilities of the normally achieving children in the present study may be considered as indicative of their higher conceptual level. Consequently the effective performance of the normal achievers under both training conditions is not entirely unexpected. A further consideration to be taken up in the later discussion of helplessness effects is that the manifestation of learned helplessness in the normal achievers was too slight for the instructional conditions to have any significant impact on subsequent task performance.

Overall, the findings for the two groups support the research hypothesis that successful experiences of coping with failure will reverse learned helplessness. In practical terms, however, this conclusion must be modified by the specificity of the training effects and the clear implication, that as far as problem-solving behaviors are concerned, learning disabled and normally achieving students have differing instructional needs. The findings also hold implications for the proposal of the helplessness theory (Abramson et al., 1978) that experiences of success will reverse learned helplessness. In view of the specificity of the training effects in the present study and the ineffectiveness of mastery procedures in other training studies (Chapin & Dyck, 1976; Dweck, 1975), future theorizing on the alleviation of learned helplessness may need to refine the notion of success. The training studies have clearly indicated that all experiences of success do not induce the belief that it is possible to cope with a problematic situation.

The contrasting patterns of helplessness effects also indicate a difference in the significance of the training procedures for the two groups. For the LDs, tutor-assistance was crucial for reducing helplessness deficits on the Success Task. For normally achieving children, instructional conditions were less critical for effective performance. Although impaired performance was apparent in the greater length of time required for task solution, the normally achieving children were more likely than their LD counterparts to persist with a problem to reach a solution than to withdraw from it. Furthermore, the untrained normal achievers were more likely than the untrained LDs to involve themselves actively with an unstructured task in the absence of tutor direction. Finally, the normally achieving boys without training showed continuing motivation to succeed with a challenging problem, a behavior which is incompatible with the notion of learned helplessness.

The strategies displayed by the untrained normal achievers seem to be indicative of effective problem-solving performance since these children did not differ in the number of problems solved from the trained normal achievers. Their performance thus provides strong support for the thesis that the voluntary use of coping strategies is an important aspect of the growth of independence and mastery. In comparison, the finding that LD children tend to withdraw from a novel task when difficulties arise supports the position that these children have learned to be helpless and that their initial academic difficulties have generalized to other achievement-related situations.

The LD children did not differ significantly from the normally achieving children in nonverbal intelligence, although a mean difference of 5 points was observed. Yet on a novel, nonverbal task in the absence of direct tutor-assistance, LDs showed impaired performance and an absence of active and efficient coping strategies. Where the normally achieving children were able to employ existing strategies to deal with a problematic situation, the helpless LDs required explicit assistance in the development of task strategies.

The dependence of the LD children on direct, structured assistance carries with it the implication that instructional procedures for these students should also aim at the growth of independent coping strategies. The components of this transition from ineffective to effective performance have been analyzed by Bandura (1977b) in his recent statement on self-efficacy theory.

> . . . generalized lasting changes in self-efficacy and behavior can best be achieved by participant methods using powerful induction procedures initially to develop capabilities, then removing external aids to verify personal efficacy, then finally using self-directed mastery to strengthen and generalize expectations of personal efficacy. (p. 202)

The present study has illustrated, in miniature, the phases of this transition. Tutor-assistance in conjunction with training problems which turned initial failure into success, acted as a powerful procedure for inducing effective performance in the LD children. Perceived competence is implicit in the LDs' subsequent effective performance on the novel test task in the absence of external aid, and their apparent willingness to return to the task at a later date. The goal of self-directed mastery is illustrated by the normally achieving children's use of coping skills to aid effective performance.

The attributional findings have emphasized the salience of strategy-oriented cognitions for children's problem-solving behaviors. A personal strategy response attributes failure to ability factors, but differs from the generic attributions to ability obtained in earlier studies (e.g., Dweck & Reppucci, 1973) in that the inability is specific to a particular task strategy. Personal strategy attributions, therefore, differ from ability attributions which focus on stable, internal reasons for failure. The integration of a situationally-specific inability with task performance suggests a focus on the requisite coping skills available to the learner. While the use of personal strategy attributions implies personal responsibility for task failure, in marked contrast to generic attributions to ability, it does not imply an immutable state of affairs. It is usually possible to attempt an alternative task strategy.

The situationally-specific nature of the attribution data in the present study has not been unanticipated by the attribution theorists. Recent statements from Weiner (1979) and Kukla (1978), for example, reveal an increasing recognition of the situational determinants of attributions. Nor have the attribution theorists been unaware of the distinctive nature of children's attributions. The self-instructions and self-monitoring verbalizations of mastery-oriented children (Diener & Dweck, 1978) and the task-oriented verbalizations which accompany the mastery behaviors of young children (Nicholls, 1978) are conceptually akin to the personal strategy attributions.

In a recent statement, Maehr and Nicholls (in press) have argued that verbalizations of this nature are indicative of task-oriented achievement motivation. Task-oriented achievement motivation is contrasted with self-enhancing achievement motivation, for which ability attributions of the type suggested by earlier learned helplessness studies are salient. Maehr and Nicholls suggest that task-oriented achievement motivation is fostered by a noncompetitive environment.

If task-oriented achievement motivation does underlie the reported findings this has important implications for the education of learning disabled children. Both LD and normally achieving children made use of strategy-oriented cognitions and it was only under certain circumstances (e.g., the Success Task performance of untrained boys) that significant differences in their use of strategy-oriented verbalizations began to appear. Although the noncompetitive experimental procedures may have evoked the initial appearance of the strategy-oriented verbalizations, the absence of perceived coping skills in the untrained LDs apparently reduced their effectiveness for directing subsequent task strategies.

In the terms of the preceding analysis, untrained normally achieving children were able to direct their cognitions toward alternative strategies for coping with the failure. Thus, strategy-oriented attributions themselves may be employed as coping strategies for dealing with initial failure on a task. In this way the attribution of failure to a specific strategy may cue the child to attempt an alternative approach. The helpless LD children, in contrast, who tended to blame task difficulty for their failure, would be more likely to inhibit further attempts at solution and withdraw from the task. The use of a task difficulty attribution may then reflect an inability to differentiate a task in terms of its component problem-solving strategies.

The performance data have already indicated that LD children require explicit help in the development of effective task strategies. The attribution data further suggest that LDs can be assisted to recognize strategy-oriented attributions as a cue for trying alternative strategies instead of a cue to withdraw from the task. The effectiveness of the modified effort-attributional procedures when these were integrated with tutor-assistance training provides some support for the remedial function of strategy-oriented cognitions. Such an approach has potential for integrating attribution retraining procedures with the specific attentional and integrative deficiencies exhibited by the disabled learner. Consequently, it represents an advance on the generic effort-attribution retraining procedures which fail to take into account the probable origins of the passive task strategies of LD children. While speculative, it is probable that many children have lapsed into passivity when they have been exhorted to keep trying in the absence of the requisite skills for effective performance.

Overall, the attribution data provide promising support for the value of cognitive instructional models (Wittrock, 1979) for the development of remedial educational services. Further, the salience of cognitions for subsequent coping strategies confirms the value of investigating children's constructive responses to failure. In this respect, the open-ended questioning technique may be a valuable tool for future investigations of children's attributions. The findings of the present study have indicated that the situational responses elicited by open-ended questions may provide a clearer picture of the function of attributions in achievement situations than do the results of forced choice procedures. Perhaps this claim is most clearly supported by the significant differences which occurred in the LD and normally achieving students' use of personal strategy attributions. Previous studies which have used indirect generalized measures to elicit perceptions of responsibility for failure (e.g., Chapman &

Boersma, 1979) have failed to yield significant differences between learning disabled and normally achieving students.

The behavioral manifestations of the phenomenon of learned helplessness have been indicated by the reported findings. Another question, however, concerns the extent to which the behavioral data support the construct of personal helplessness. For the normally achieving children, impaired performance was evident only in the longer time required for task solution on the Success Task. In view of the verbal and performance data which suggest that normally achieving students have developed strategies for coping with failure, the term, learned helplessness, seems an unnecessarily severe description of their impaired performance. The effectiveness of the coping strategies used by the normal controls strongly suggests that these children believe in their ability to deal with problematic situations.

A contrasting picture is presented by the LD data. For the LD children, the behavioral manifestations of learned helplessness were marked and consistent. It seems reasonable to conclude that the history of failure these children have experienced in the school setting has generalized to the novel experimental situation. Furthermore, the generally lower levels of school achievement of the LD sample indicate the everyday manifestation of inactive and inefficient task strategies.

In addition to a significant difference in verbal abilities, a nonsignificant trend toward lower levels of nonverbal and quantitative ability was observed from the Canadian Cognitive Abilities Test scores, for the LD subjects. Consequently, some consideration should be given to the possibility that instead of learned helplessness these children were exhibiting generally lower levels of ability. The effective performance of the LDs in the tutor-assistance condition does militate against a general ability explanation of the findings. In terms of the performance data, therefore, the concept of learned helplessness seems to provide an appropriate description of the LDs' impaired problem-solving behaviors.

An inconsistency can be detected in the findings relating to LD students. The theory of learned helplessness (Abramson et al., 1978) holds that personal helplessness involves internal attributions for failure. This proposal is consistent with the findings of other studies (e.g., Butkowsky & Willows, 1979) which show that helplessness is associated with internal attributions for failure and external attributions for success. In contrast, the LD control children who showed impaired performance on the Success Task attributed failure to task difficulty, an external factor.

Some resolution of the apparent inconsistency between the untrained LDs' performance and attribution data is possible when consideration is given to Bandura's (1977b) theory of self-efficacy. Bandura argues that perceptions of self-efficacy should be based on a microanalysis of perceived coping capabilities. It has already been argued that LD children's inefficient and passive task strategies are associated with their failure to use strategy-oriented cognitions as a cue to attempt alternative approaches. From this perspective, it is plausible to assume that LDs, in the absence of direct help with the development of task strategies, escape from the problem of task solution by claiming that the task is too difficult. Although speculative, the notion that the LD child perceives a task to be too difficult when he is unable to establish effective task strategies is consistent with the concept of personal helplessness. As Bandura (1977b) has argued, a child who expects course grades to be dependent entirely on skills he does not possess has every reason to be demoralized.

The findings of the present study have raised the possibility that the manifestation of learned helplessness in problem-solving situations may be partially determined by the availability of task strategies for coping with the problematic situation. In this regard, the apparent absence of coping strategies for overcoming a helpless reaction to failure, in the LD subjects, is consistent with the argument of Torgesen (1977) that learning disabled children are deficient in the use of active and efficient task strategies. Torgesen suggests that the inefficient performance of learning disabled children relates to a deficiency at the metacognitive level (Flavell, 1976) rather than with the child's basic cognitive processes. Flavell defines the term "metacognition" as one's knowledge concerning one's own cognitive processes and products. Thus metacognitive variables may reflect a mixture of cognitive and affective characteristics which affect the child's adaptation to task requirements.

The present findings have emphasized the role of effective strategies for dealing with failure, in terms of problem-solving performance and of cognitive awareness of task strategies. Debate on the theory of learned helplessness (e.g., Miller & Norman, 1979) has focused on the issue of whether helplessness effects obtained in the experimental studies of the construct, represent a cognitive or emotional deficit. The implication of the present findings, that learned helplessness may exist at the metacognitive level, throws some insight on the above issue. Accordingly, the study of learned helplessness as it interrelates with a variety of metacognitive variables appears to be a fruitful area for future research.

A final consideration concerns the extent to which the findings are consistent with the theory of continuing motivation. The preceding discussion has developed the idea that the voluntary use of coping strategies by normally achieving children successfully minimized any lasting effects of failure. Direct assistance with organizing problem-solving strategies apparently performed a similar function with the learning disabled children. A corresponding increase in the number of continuing motivation choices by the untrained normal achievers and the LDs who received tutor-assistance, was also interpreted in terms of coping strategies. This emphasis on the coping dimension of continuing motivation is not necessarily incompatible with the concept of continuing motivation. The ability to sustain interest in a task does imply the presence of active, independent task strategies.

Alternative explanations for the increases in continuing motivation choices may, however, be raised. A competing theory to the learned helplessness model is the theory of egotism (Frankel & Snyder, 1978; Snyder, Stephan, & Rosenfield, 1978), which accounts for the phenomenon of increased effort following helplessness induction by the need to restore self-esteem. A similar explanation, derived from research on self-reward (e.g., Bandura & Whalen, 1966), views an increase in self-reward following failure as self-therapy, or behavior engaged in to make oneself feel better. Both theories can account for the increased motivation of the untrained normal achievers following helplessness induction. Again, neither explanation is incompatible with the construct of continuing motivation. The conditions under which continuing motivation occur have still to be fully explicated (Maehr, 1976) and it may be that factors of self-esteem and self-therapy are associated with behavioral indices of continuing motivation. Furthermore, the desire to restore self-esteem may be viewed as a reflection of the need to reconfirm perceptions of personal efficacy. From this perspective, the interpretation of the increase in continuing motivation choices as a coping strategy gains credence from both the egotism and self-efficacy theories.

The predicted influence of self-instructional procedures on the continuing motivation of normally achieving students was not demonstrated. Nor did the expected a[illegible]tion of motivational deficiencies and helplessness deficits emerge. Several factors could have contributed to the absence of the expected effects. The brevity of the experimental conditions, and the particular activity used to assess generality of helplessness may have interfered with the expected relationships. In view of the effective coping strategies employed by normally achieving children, the training conditions may not have been salient for these subjects. In addition, the most marked influence of instructional conditions on continuing motivation has been with regard to conditions of evaluation (Maehr, 1976). Since the evaluative dimension was minimized in the present study, similar effects would be less likely to occur.

Despite inconsistencies with the findings of earlier studies of the construct, the increases in continuing motivation choices shown by the learning disabled and normally achieving children under conditions of tutor-assistance and no-training, respectively, do indicate the significance of the construct for the study of coping strategies. The interpretation of continuing motivation in terms of coping strategies thus seems to offer a useful perspective on the alleviation and prevention of learned helplessness in children's problem-solving behaviors.

Application of the Findings

The design of the study restricts the generalizability of the findings to comparable groups of fourth-grade boys. A second limitation arises from the restriction of the data to laboratory-type tasks and the absence of naturalistic observations on children's reactions to failure. Finally, the high variability of response associated with all the dependent measures suggests that some caution should be applied in the interpretation of group differences. With these limitations in mind, the results of the study will be examined for their implications for educational practice and for future research.

The study has provided convincing evidence of the crucial importance of children's coping strategies for effective performance in problematic situations. Learning disabled children have been shown to be deficient in the voluntary use of coping strategies. In the case of these students explicit help in the use of efficient strategies was effective in minimizing the disruptive effects of failure. In view of the learning disabled student's dependency on external aid, the data strongly suggest that intervention procedures with these students should focus on the development of independent coping strategies in addition to specific cognitive remediation.

The ability to cope with failure requires the learner's acceptance that uncertainty and error are a normal part of learning. Having recognized the problematic nature of the situation, the independent learner then requires the belief that he can cope with the particular challenge. Bandura's (1977b) theory of self-efficacy has suggested that perceptions of personal efficacy are dependent upon successful experiences with the component coping capabilities of effective performance. From this perspective, it is essential that child[illegible] experience error in their learning and develop skill[illegible]th initial task failure. Mastery learning approaches [illegible] upon structured experiences of success, do not therefore, [illegible]e the necessary conditions for develop[illegible]eived coping skills.

It has been suggested (Br[illegible]d, 1974) that many teachers do not know how to respond to fai[illegible]. If instructional procedures [illegible] to permit errors to occur, teacher han[illegible]g of the wrong responses [illegible] helpless students may be critical for subsequent attempts at coping with error. The attributional data hav[illegible]uggested one method by which teachers can channel the student's verbal reactions to failure into efficient task strategies. If teachers' responses are prompted by children's specific cognitions of the task it is then feasible to integrate intervention procedures with the individual's perceived deficiencies. By attending to situations as they are perceived by the learner, teachers thus have a practical approach for attempting to deal with individual differences in achievement. In terms of the above analysis, a coping-based approach to educational remediation will require the adoption of a cognitive model of instruction.

One further concern for the educator arises from the proposed cognitive model. If children's cognitions are to form a basis for teachers' intervention procedures it follows that the educational setting must provide a noncompetitive atmosphere in which strategy-oriented cognitions will emerge. An overemphasis on evaluation is likely to evoke the debilitating ability attributions which interfere with attempts to cope with initial task failure.

Finally, several implications for future research on children's reactions to failure arise from the results. The voluntary use of coping strategies by the normally achieving students suggests that a naturalistic investigation of children's independent and constructive responses to failure in the classroom setting would tap a rich source of data relating to the role of coping strategies in learning. Furthermore, a naturalistic approach has potential for documenting the individual differences affecting children's reactions to failure.

A second direction for research lies in the development of intervention procedures for integrating children's cognitions of a task with desirable task strategies. The value of such a development lies not only in its attention to the problem of individual differences in learning, but for its potential application to the insights of other fields of research concerned with the problem learner which have identified specific deficiencies in problem-solving strategies.

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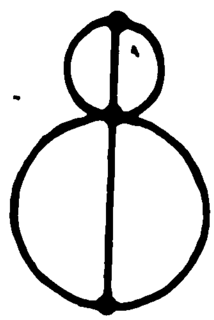
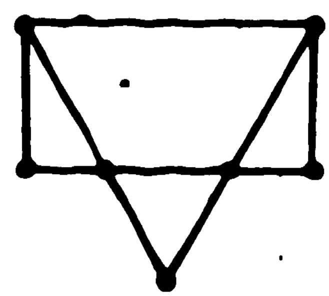
APPENDIX A

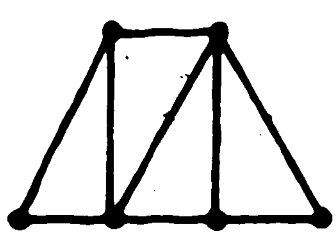
THE FAILURE TASK MATERIALS

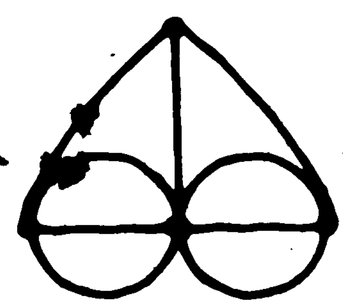
Demonstration and Practice Puzzles for the Failure Task



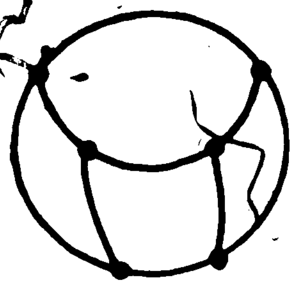


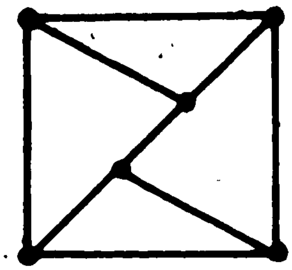
Solvable Puzzles for the Failure Task

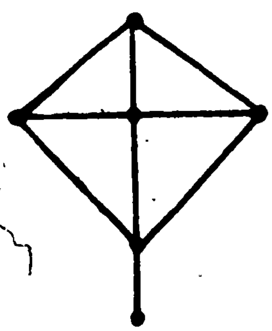


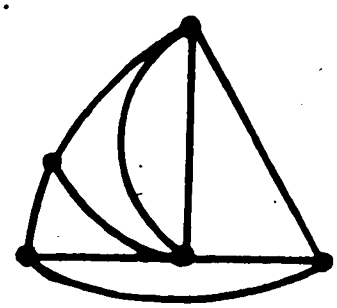


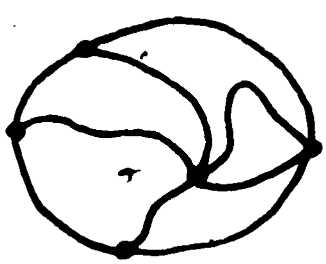
Unsolvable Puzzles for the Failure Task

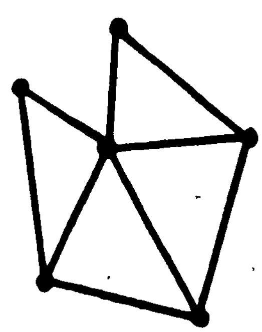






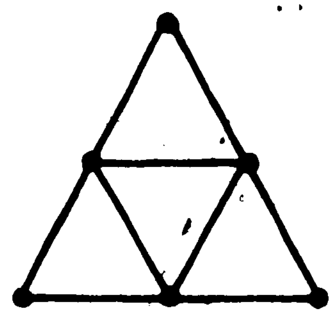


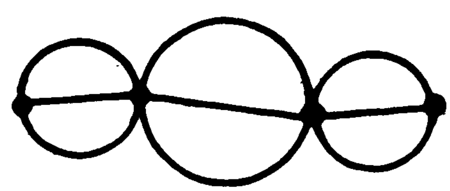




Solvable Puzzles for the No-Training Subjects'

Post-Experimental Success Experience

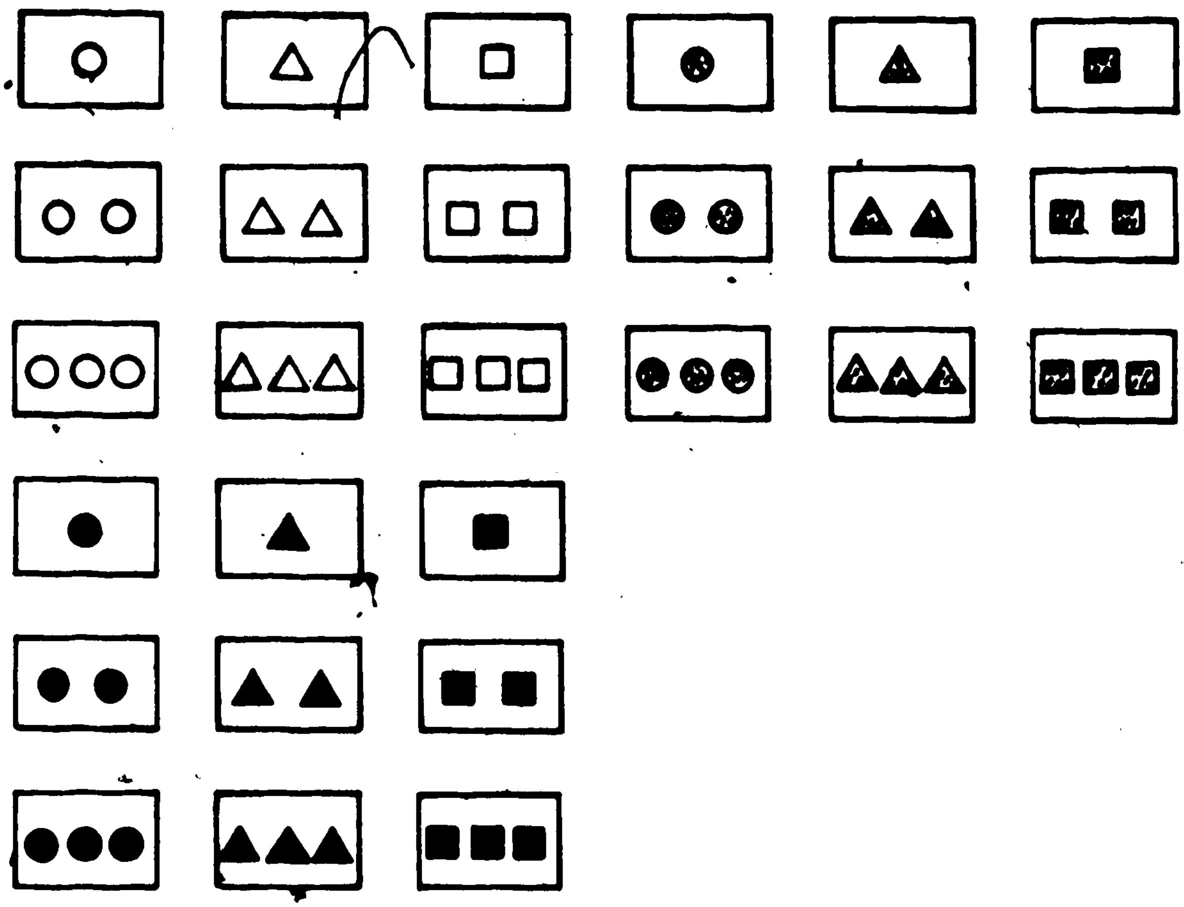




APPENDIX B

THE TRAINING TASK MATERIALS

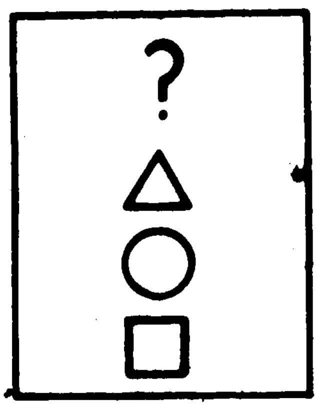
Attribute Cards for the Training Task



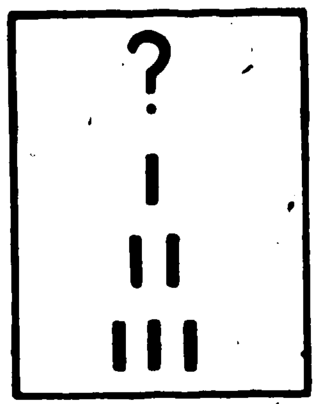
Notes. 1. Actual size of each card was 10 by 6 cm.

2. Each card varied according to the three attributes: shape, number of objects, and color (red, yellow or green).

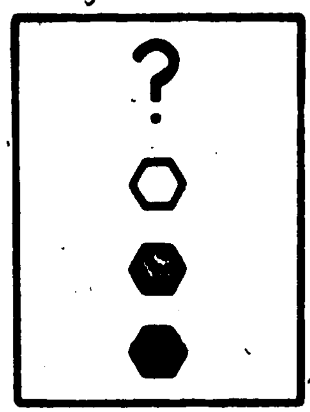
Cue Cards for the Self-Instructional Condition on the Training Task



Cue for shape



Cue for number of objects

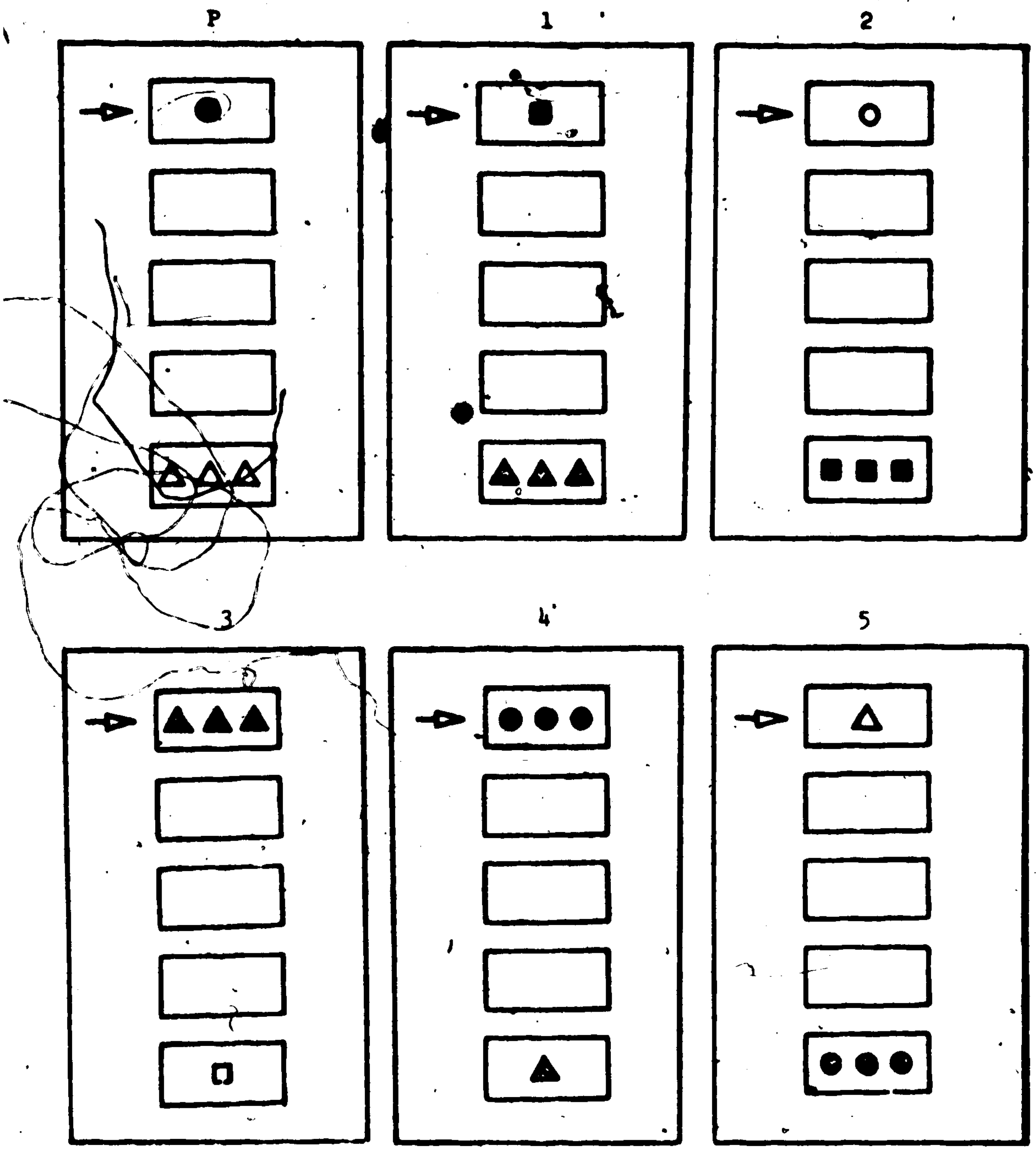


Cue for color

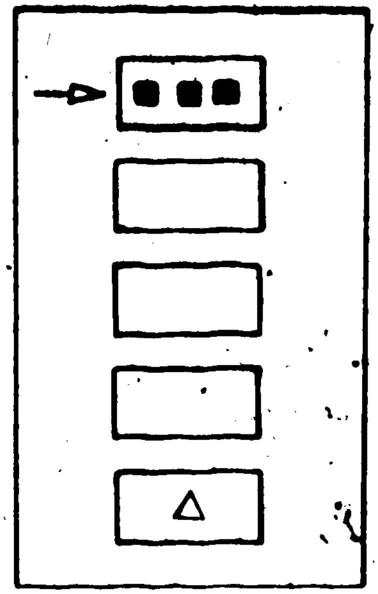
Note. Actual size of card was 10 by 6 cm.

Problem Cards for the Training Task

Card	P	Practice trial to introduce training procedures.
	1	Failure trials plus training procedures.
	2	"
	3	"
	4	"
	5	"
	6	Training procedures without failure manipulation.
	7	"
	8	"
	9	Success trials.
	10	"


P
1
2
3
4
5

6



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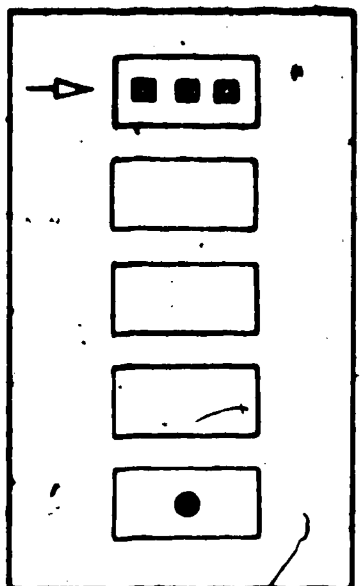

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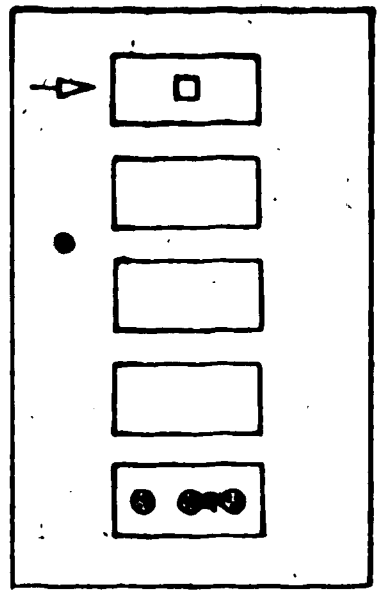

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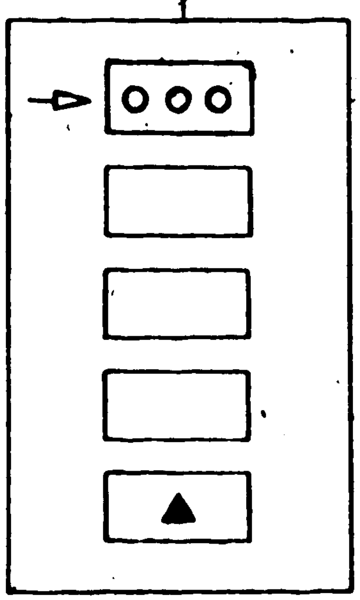

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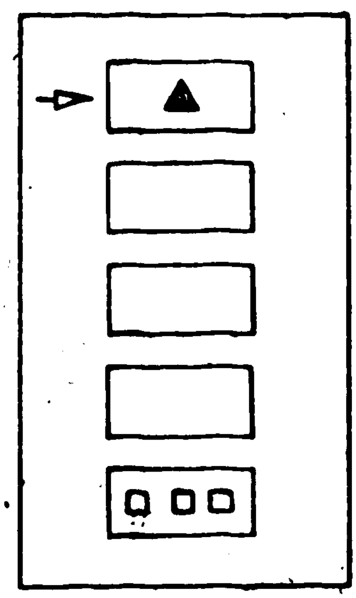


Instructions for Use of the Attribute Cards in the Training Conditions

Introduction

Introduce the tutor-assistance and self-instructional conditions with the following words.

> The next puzzles are called sequences. This time if you have trouble solving the puzzle you can do something to help yourself work it out.

Spread the 27 attribute cards in front of the subject and state:

> These cards are called pattern cards. The patterns are different in three ways. Some have a different shape, some have a different color, and some have a different number. A sequence is a series of cards which are linked together by patterns which are the same in two ways but different in a third way.

Introduce the training conditions with the demonstration trial.

Tutor-assistance

Demonstration trial. I will show you how to work out a sequence. (Place first card and last card in position, i.e., according to problem card, select the second (third, fourth) card from the attribute cards on the table and place in position in the series.) I have changed the color (shape, number) from red to green. The shape and number are the same. (Continue describing each card selected in the same way.)

Practice trial: Introduce training procedure. Here is a sequence for you to practise with. If you are having trouble there is something you can do. You can ask me to check each card you choose to help you to work out the sequence.

Incorrect move: No, you are wrong. You have changed both the (color) and the (shape). You should have changed the (color) only. (Indicate appropriate card.)

Completion: I'll check the sequence. You have changed one green circle to two green circles, two green circles to two red circles, etc. Good. You've found a way to work out the sequence.

Trials [illegible]-5: Failure trials plus training procedures.

Introduce timing: Children your age usually choose the correct card in a sequence in 20 seconds so I will stop you if [illegible] chosen a card by then, or if you make a mistake.

Interruption: No, your time is up. You should change the (color). The (shape) and (number) will stay the same. (Continue responses to incorrect moves and completion as above.)

Trials 6-8: Training procedures without failure manipulation. Maintain assistance following an incorrect move and completion of the sequence. Discontinue interruption.

Trials 9-10: Success trials. Discontinue tutor check at the completion of the sequence. Provide knowledge of results with "That's correct."

Self-instructional

Demonstration trial. I will show you how to work out a sequence. These cards are cue cards and I will use them to remind myself about the color (indicate color cue card), the shape (indicate) or the number (indicate) of the pattern. (Model the use of cue cards to assist with card selection and checking the sequence.)

Card selection: I am starting with a red triangle so I will change the color first (indicate color cue card). The shape (indicate) and number (indicate) are the same.

Completion: I changed a red square to a green square-color (indicate color cue card), a green square to two green squares-number (indicate), etc.

Practice trial: Introduce training procedure. Here is a sequence for you to practise with. If you are having trouble there is something you can do. You should check the cue cards to help you to work out the sequence.

Incorrect move: No, you are wrong. You haven't been checking your cue cards. Check the cue cards to remind yourself about the color, shape, and number of the pattern.

Completion: (If necessary provide prompt--"Check your sequence with the cue cards.") Good. You've found a way to work out the sequence.

Trials 1-5: Failure trials plus training procedures.

Introduce timing: Children your age usually choose the correct card in a sequence in 20 seconds so I will stop you if you haven't chosen a card by then, or if you make a mistake.

Interruption: No, your time is up. Check your cue cards. (Continue responses to incorrect moves and completion as above.)

Trials 6-8: Training procedures without failure manipulation. Maintain prompts following an incorrect move, and completion (if necessary). Discontinue interruption.

Trials 9-10: Success trials. Provide knowledge of results at completion of the sequence with "That's correct."

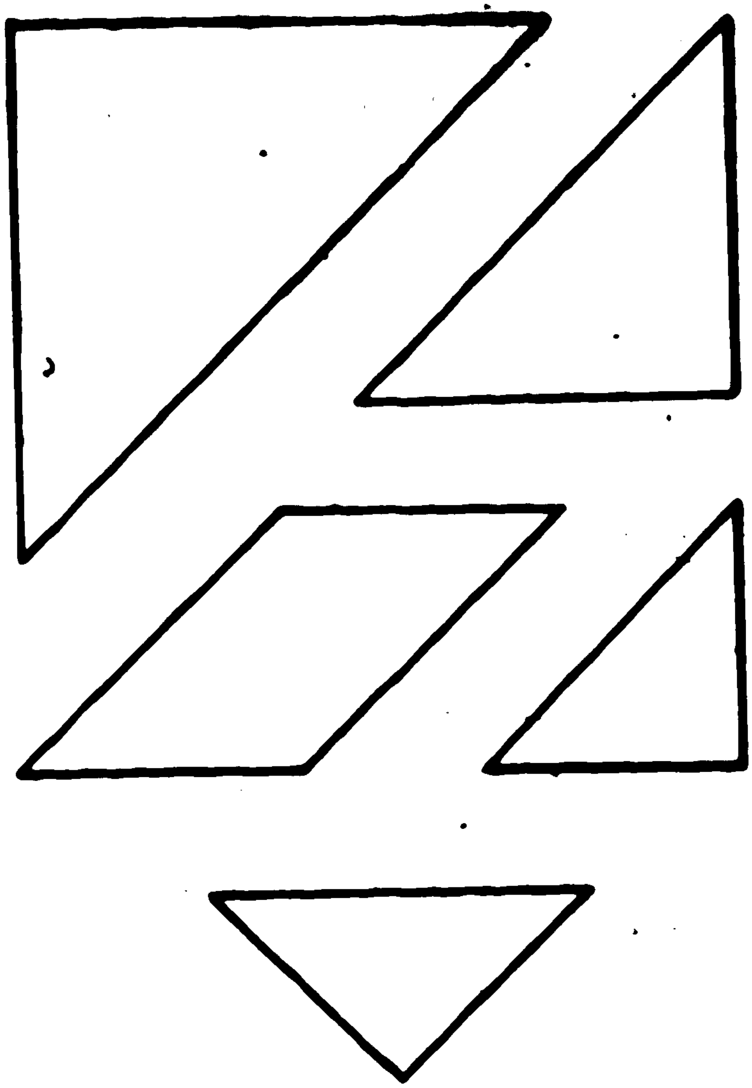
Note. If an incorrect solution is presented for the Success trials, provide appropriate prompt for training condition and allow an additional success trial.

APPENDIX C

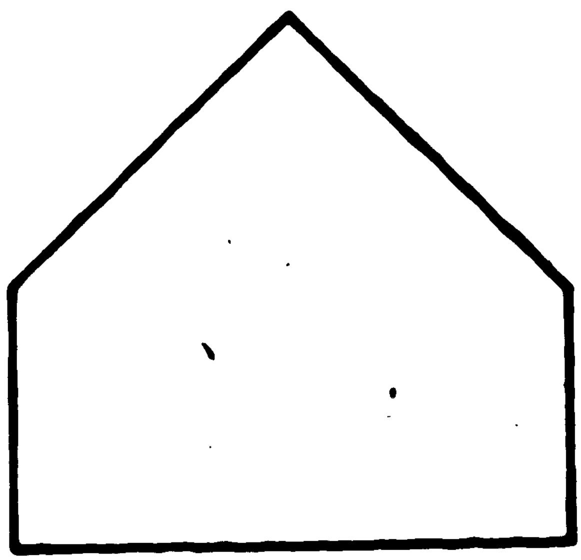
THE SUCC[illegible] [illegible]

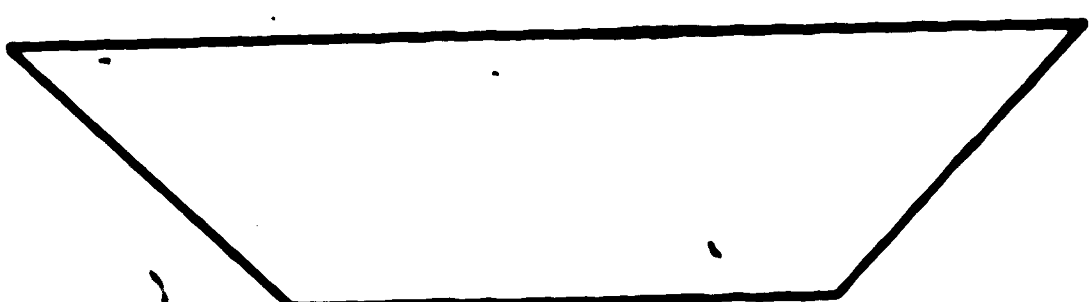
The Five Pieces [illegible]

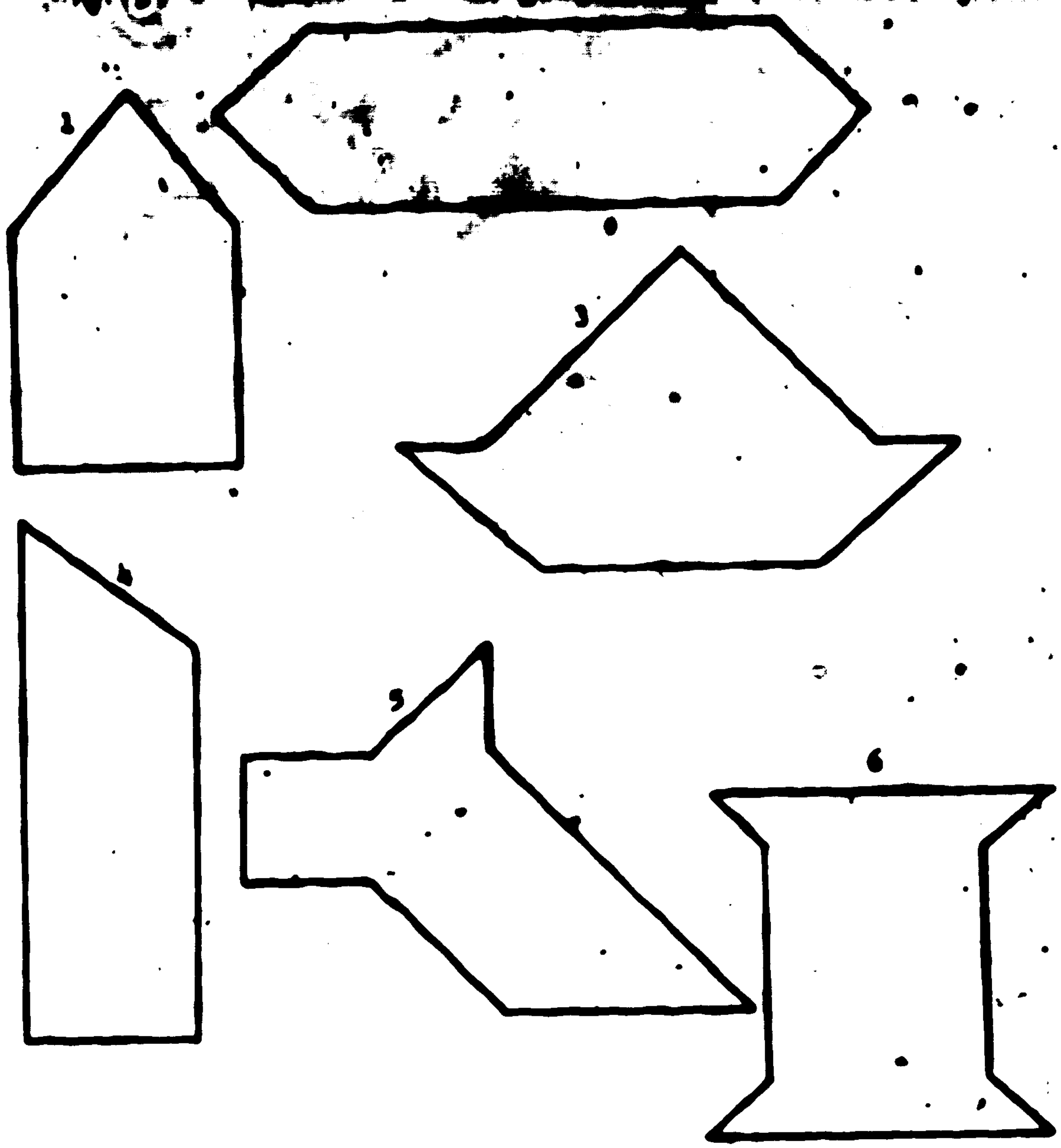
[illegible]



Note. Pieces were colored black.







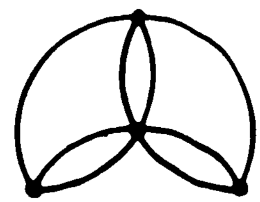
Note. Reduced in size. Each puzzle was presented on a card 28 by 21 cm.

APPENDIX D

MATERIALS FOR CONTINUING MOTIVATION CHOICES

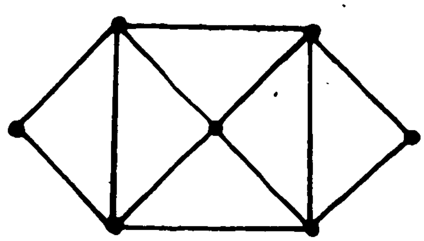
This drawing is a

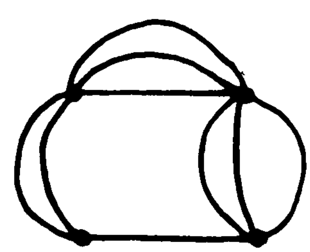
NETWORK

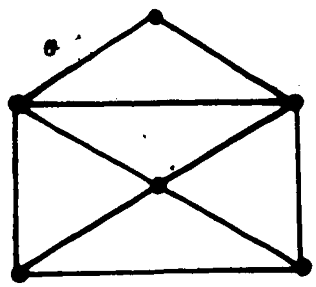


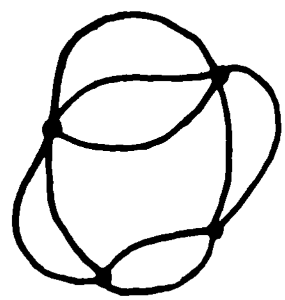
Copy each Network without lifting your pencil and without going over any line twice.

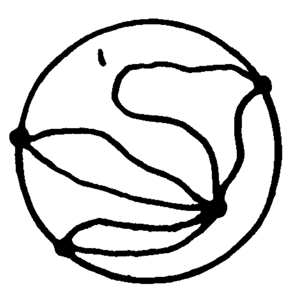
Draw some Networks of your own.

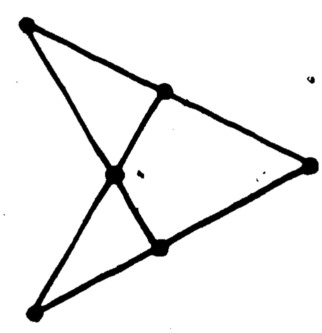






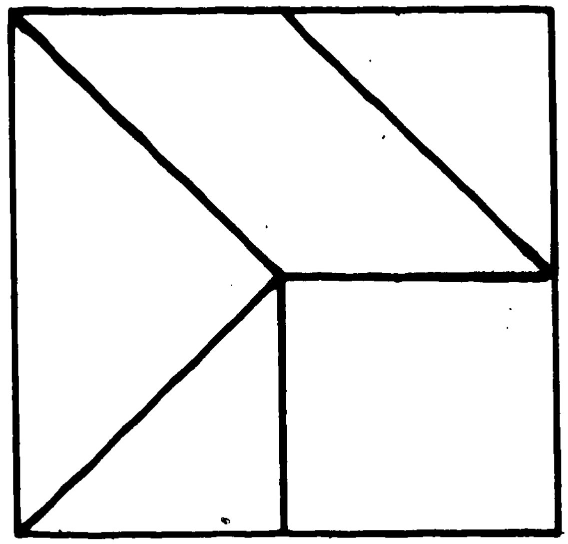






This puzzle is a

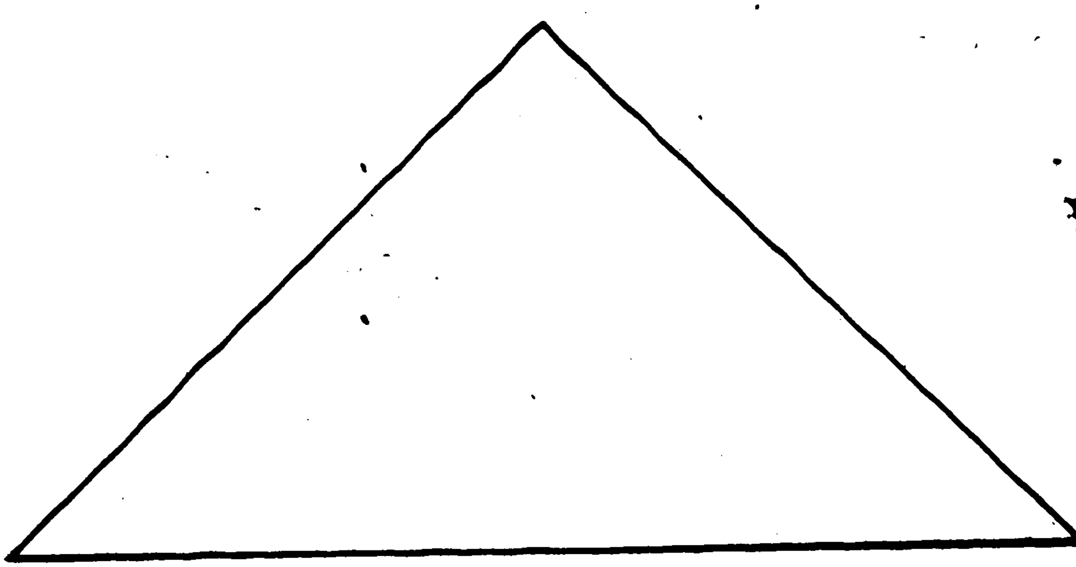
TANGRAM

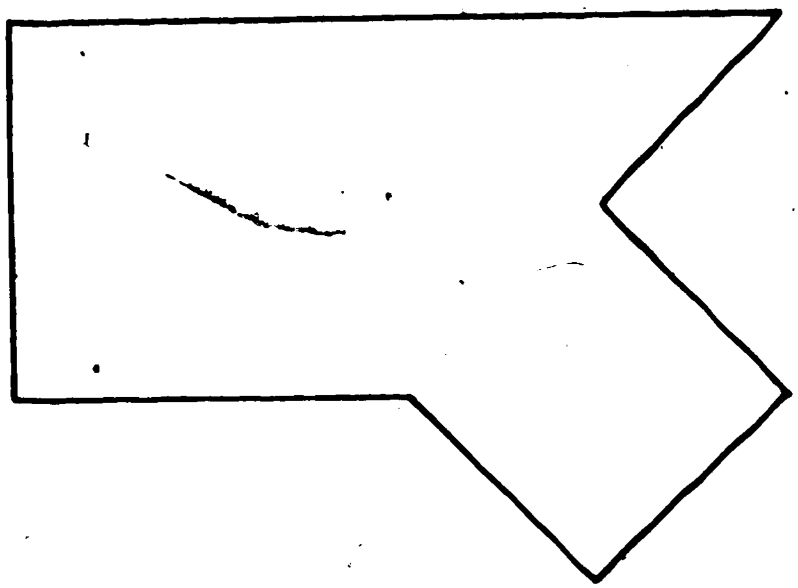


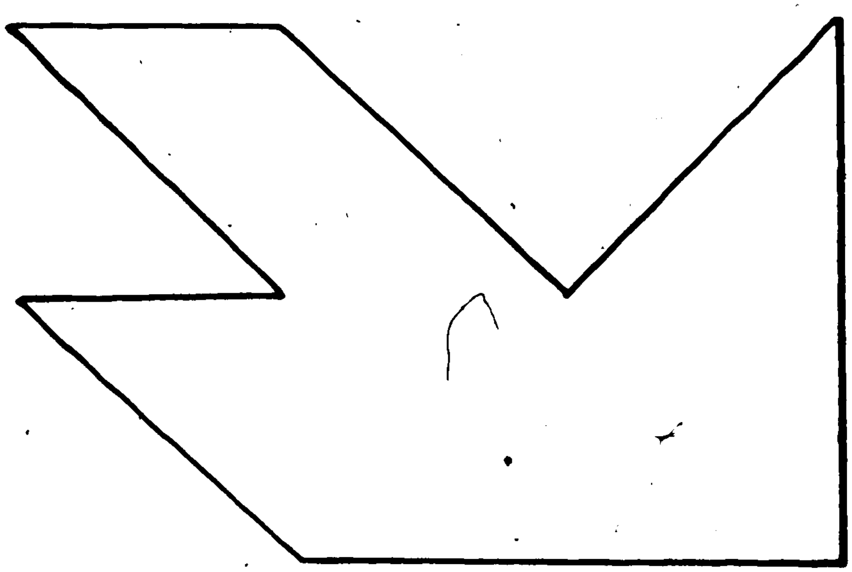
Cut out the Tangram pieces.

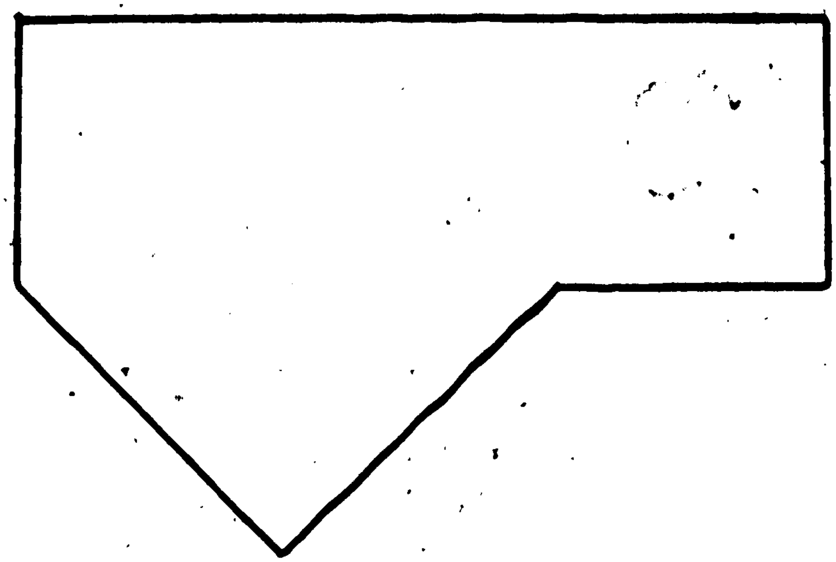
Fit the Tangram shapes.

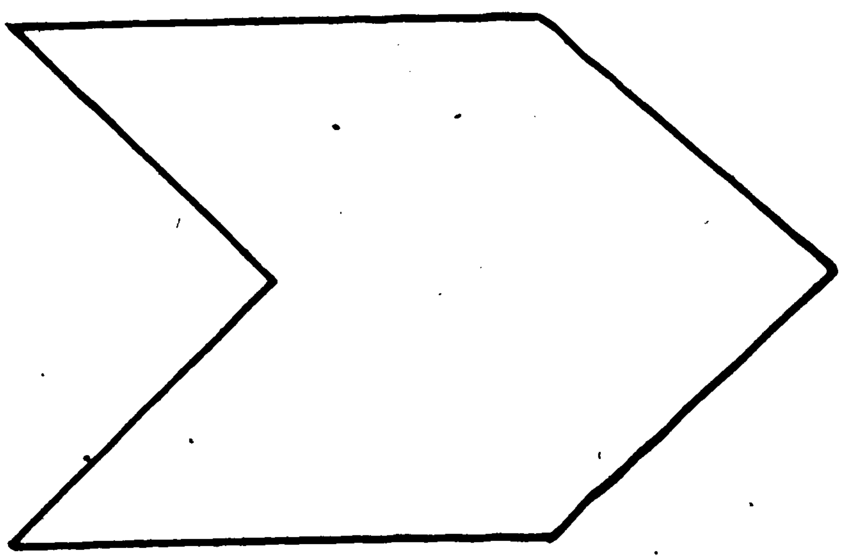
Make some more Tangram shapes to try.











APPENDIX E

CODING CRITERIA FOR THE ATTRIBUTION DATA

Personal strategy. Refers to own responsibility for task failure. May be a specific action or strategy, e.g., I couldn't find out where to go; I tried everything and got trapped; or a general statement relating to task performance, e.g., Because I didn't figure out how to do one; I couldn't get the idea of them. Personal strategy responses to the probe question "What did you think about when you were stuck on a puzzle?" refer directly to task strategy but do not necessarily refer to task failure, e.g., I was thinking of how to get a way to go; I was thinking of a different way to try and do it. All personal strategy statements are "I . . ." statements.

Task difficulty. Refers to specific features of the task to which failure can be attributed. Does not associate task characteristics with own actions or strategies which could overcome difficulties of task solution. The difficulty level of the task may be expressed explicitly, e.g., It was too hard; Some of them were pretty hard; or implicitly by referring to difficult aspects of the puzzles, e.g., The shapes aren't right; Cause they had tricky lines on them.

Time. Attributes failure to insufficient time. Refers explicitly to the time required for the task, e.g., I took too long to do it; I didn't have enough time; or implicitly by referring to the next puzzle, e.g., I thought I should try the next one; I thought I'd just better go to the next one and not waste time.

Don't know. Includes all NR (no response) and don't know responses.

Note. Code each response in one category only. If two categories are reflected in the response, code the statement which most reflects task involvement, according to the following order: (1) personal strategy, (2) task difficulty or time, (3) don't know.

Examples. I don't know (don't know). Maybe I need more time (time). Code--time.

I tried to draw it different ways (personal strategy) but there was always one line over (task difficulty). Code--personal strategy.

APPENDIX F

CODING CRITERIA FOR THE SPONTANEOUS VERBALIZATIONS

Success-oriented. All verbalizations which refer to attempts to solve the problem. Includes self-instructions, e.g., I'm going to change this; I'll fit this big one first; self-monitoring, e.g., I did something wrong here; I can't go like that; statements of task completion, e.g., There, I finally did it; That one's done; statements of positive affect, e.g., Oh one more--Goodie; I'm bound to get this one.

Failure-oriented. All verbalizations which express negative reactions to the task or are task-irrelevant. Includes expressive statements, e.g., I'm tired, I wish it was lunch-time; statements of task difficulty, e.g., This is too complicated; They're getting harder; statements expressing withdrawal from the task, e.g., I give up on this one; I'm going to the next one; statements of negative affect with regard to the task, e.g., I'm just wasting paper; I'll never do it.

Questions. Asks for help or asks about task requirements, e.g., Will that do?; Can I go over this line like this?

Note. Mark a statement as ambiguous if it is not possible to tell from the context whether it is success-oriented or failure-oriented. For example, the verbalization "No" could be a self-monitoring statement or a statement of negative affect. (Ambiguous statements were subsequently eliminated from the analysis.)

APPENDIX G

RESPONSE FREQUENCIES FOR THE SUBSIDIARY ANALYSES OF THE ATTRIBUTION DATA

Number of Boys maintaining Don't Know responses to the probe question "What did you think about when you were stuck on a puzzle?" after giving Don't Know responses to the Attribution Question on the Failure Task

Personal Strategy	&	External Attribution	Don't Know	X^2	p
	23		4	13.370	$<.001$

Number of Boys giving Personal Strategy or External Attribution responses to the probe question "What did you think about when you were stuck on a puzzle?" after giving Don't Know responses to the Attribution Question on the Failure Task

Responses to the Probe Question "What did you think about when you were stuck on a puzzle?" for Boys giving Don't Know responses to the Attribution Question on the Failure Task as a Function of Group Membership

Category	LD	NA
Personal strategy	10	8
Task difficulty	3	1
Time	0	[illegible]
Don't know	2	2

Number of Boys maintaining Don't Know responses to the Probe Question "What did you think about when you were stuck on a puzzle?" after giving Don't Know responses to the Attribution Question on the Success Task

Personal Strategy & Internal Attributions	Don't Know	X^{2a}	p
12	2	5.786	$<.02$

a Corrected for continuity

Responses to the Probe Question "What did you think about when you were stuck on a puzzle?" for Boys giving Don't Know responses to the Attribution Question on the Failure Task as a function of Group Membership

Category	LD	NA
Personal strategy	7	3
Ability	0	1
Effort	1	0
Don't know	2	0

Responses to the Question "What did you think about when you were stuck on a puzzle?" for Boys giving Six Correct Solutions on the Success Task

Category	LD	NA
Personal strategy	3	5
Effort	0	1